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ON HYPOCHONDRIASIS AND NOSOPHOBIA.

By Julius Althaus, M.D., M.R.C.P. Lond.,
CONSULTING PHYSICIAN TO THE HOSPITAL FOR EPILEPSY AND PARALYSIS, REGENT'S PARK, LONDON.

It is a singular fact that while medical authors of the seventeenth, eighteenth, and the first half of the nineteenth centuries have written very copiously on hypochondriasis, the more recent treatises on diseases of the nervous system by Rosenthal, Grasset, Buzzard, Ross, Oppenheim, and others should be absolutely silent on this subject. In Leube's valuable and exhaustive work on the diagnosis of nervous diseases, which appeared a few months ago, hypochondriasis is only mentioned by the way, in a few lines, as an apparently insignificant condition. The periodical literature of the day teems with papers on hysteria, chorea, epilepsy, and other nervous maladies, but the word hypochondriasis is rarely, if ever, met with. This neglect of the disease by modern writers, whom hardly anything escapes, might at first sight convey the notion that hypochondriasis had recently ceased to prevail, but such an explanation is contradicted by well-marked cases of it which we are in the habit of meeting in practice. Least of all could such an assumption be entertained in England, since this country has, more especially by French authors, always been considered as the real home of hypochondriasis, this being in their opinion due partly to our damp and foggy climate, which is believed to create a tendency to indigestion and liver affections, and partly to the odd mixture of aristocratic and democratic government obtaining here, which is said "to lead to constant agitation and endless disappointments."

To my mind the circumstance just mentioned is rather to be accounted for by the prominence which has of late years been given to the study

of the group of symptoms known as neurasthenia, and for which I have recently proposed to substitute the term "encephalasthenia" as better suited for it. In the latter neurosis, various forms of fear, such as agoraphobia, claustrophobia, zoöphobia, and many other kinds of apparently groundless alarms and panics are prominent symptoms. Such patients entertain not infrequently a fear of the invasion of some disease or of impending death; for these latter conditions the terms nosophobia, pathophobia, and thanatophobia have been proposed, and have by some writers been used as equivalent with hypochondriasis. It is one of the objects of the present paper to draw a distinction between these conditions, and to show that hypochondriasis is a well-marked neurosis by itself, plainly distinguishable from other neuroses by its definite symptoms, course, and termination, differing, on the one hand, from nosophobia, and, on the other hand, from hypochondriacal insanity, with which it has been confounded by some writers on psychological medicine.

Hypochondriacal Insanity.—It is a great mistake to assume that most hypochondriacs are insane; on the contrary, they are frequently in good mental health for the ordinary purposes of life. There is certainly no lack of decision and no want of judgment. In the beginning of the affection more especially, the patient, far from experiencing any difficulty in going on with his usual occupations, often seems to find the exercise of his intellectual faculties actually easier than it was before. This is probably owing to the fact that when his attention is diverted into other channels he forgets to some extent the distressing sensations which he experiences when his mind is not fully occupied, so that intellectual exertion is an actual relief. It is only in the further progress and later stages of the complaint that no occupation or distraction will succeed in making him forget his misery. The mind, by being incessantly fixed on a single idea, is then apt to lose its balance, and the intellect may become deteriorated.

Simple hypochondriasis only seldom merges into hypochondriacal insanity or imbecility, and the difference between these several conditions seems to me to be a fundamental one. Thus I would call a man a hypochondriac who believes himself to be suffering from cancer of the liver because he experiences uneasy and distressing sensations in that organ or its neighborhood, and who keeps dwelling and brooding on his condition in spite of being assured by his medical attendant that he has no such disease. On the other hand, a man who expresses his belief that he has a load of hay in his head, or that his body has been changed into glass, or that he cannot move his legs because they have been turned into wood, or wax, or gold, or velvet, cannot be called a hypochondriac, but is either insane or imbecile. Another distinction between the two conditions is that in hypochondriacal insanity delusions are habitually entertained about the origin of the complaint, which the patient looks upon as a

punishment inflicted by the Almighty for his sins, or as owing to poison administered to him by his friends or servants, or as caused by persons who magnetize or electrify him against his will, etc. The real hypochondriac is never subject to such delusions, but often hits the mark by attributing his illness to inheritance, overeating and drinking, excitement, overwork, and similar tangible causes.

Hypochondriacal symptoms are likewise apt to occur in persons suffering from general paralysis and other organic diseases of the nervous system, and are then mixed up with such objective signs as alteration in the size of the pupils, difficulty in speaking, reading, writing, and walking, and general failure of mental power, etc. Again, nocturnal epilepsy, which may exist without the patient or his friends being aware of it, may be accompanied with symptoms of hypochondriasis, and may thus be mistaken for the latter. The symptoms of hysteria, on the other hand, are so widely different from those of hypochondriasis that it is difficult to understand how such excellent observers as Sydenham, Hufeland, and others could have believed the two conditions to be identical. This error may perhaps be accounted for by the fact that the one neurosis is sometimes found complicated with the other. The symptoms of hysteria have of late been so pointedly described by numerous authors that I do not consider it necessary in this place to dwell upon the features by which they are distinguished from those of hypochondriasis.

The Nature of Hypochondriasis.—The characteristic feature of hypochondriasis is that the patient habitually experiences a feeling of profound illness, based on a variety of peculiarly distressing and harassing sensations to which he is subject, and which he refers to one or several of the viscera of his body. These sensations will, if sufficiently long continued, gradually engross his attention to such an extent that he can think of little else, and is led to brood over their significance and eventual issue. His imagination thus becomes disordered, and he creates for himself one or several imaginary illnesses from which he believes himself to be suffering. The sensations are, therefore, real, but the construction put upon them is false, and the further development of the neurosis hinges upon this peculiarity.

Forms of Hypochondriasis.—In a considerable number of cases the head is the principal seat of the odd and distressing sensations which are experienced. There may be pain, but complaints are more frequently made of pressure, tightness, fulness, dryness, icy coldness or boiling heat, creaking, splitting, the ticking of a clock in the head, etc., explosions by which the brain appears to be shattered, a sensation as if ants or snakes were creeping or crawling about it, or as if the brain were pulled as hard as possible in different directions, or torn up by claws, or filled with live coals, etc. Where such and analogous feelings are frequently experienced we cannot be surprised that the patient should be led to

imagine that he is suffering from some terrible and extraordinary brain disease, by which that organ has been softened or otherwise destroyed. He thinks that a bloodvessel or something else has burst in the head, that there is a cavity inside, or that he is going to have a stroke of apoplexy or paralysis, or to become insane, or die an idiot. In this form of the disease we also meet sometimes with that strange disorder of visual perceptions in which the sufferer finds on looking at himself in the glass that his face has quite a different appearance from what it used to have, or that, when he looks steadily at an object, it suddenly appears to him to go up and down, or otherwise to change its aspect. After reading a paper or a book for a few minutes he will suddenly start up and say that the lines are all awry and his sight is blurred or quite gone, or he finds that certain objects and colors are painful for him to look at. Where such visual disturbances occur every few minutes, as I have found them to do in certain cases, one can really not be surprised that the patient should lose his nervous balance, ask repeatedly whether he is going mad, and should talk all day long to his friends about nothing but the bewildering sensations which crowd on his attention. Such hallucinations of sight as I have just mentioned do not constitute a special kind of hypochondriasis, as has been asserted by Mendel, but seem to me only to show that a portion of the brain is suffering which is in intimate connection with the visual centres. I have known them to be connected with similar hallucinations of smell and taste, and such distressing sensations in the abdomen that the patient imagined himself to be suffering from obstructions of the bowel and cancer of the rectum. They are, therefore, only one of the numerous symptoms which are apt to occur in hypochondriasis, showing a complete disorder of function, or, as Sydenham expressed it, *ataxy of the animal spirits.*

In another set of cases there are few or no cephalic symptoms, and the chief seat of the distressing sensations is the *digestive tract.* The patient keeps looking at his tongue every few minutes, and has such odd sensations in it that he thinks an ulcer must be forming there; or he complains of choking sensations while eating or drinking; he imagines that he has lost the power of swallowing, and that hydrophobia is going to develop. There are often excessive belching, loud eructations, hiccough, regurgitation of food, nausea or vomiting, and such awful feelings in the stomach as to convince the sufferer that he has at the very least gastric ulcer or cancer. In other cases there are such fulness, heaviness, distention, and noise in the lower bowel that he imagines the gut to be obstructed, and thinks the anus closed, so that nothing can pass through him. The chest may likewise be the seat of painful and harassing sensations. Many patients complain of præcordial anxiety, or of a feeling that their heart is bursting or jumping out of the chest, or that it has ceased to beat; that circulation is no longer carried on, and

that death is impending. They imagine that the heart is dried up, or otherwise diseased, subject to polypus, aneurism, or fatty degeneration. A dry cough and a troublesome expectoration of a little light or dark mucus, together with the feeling of a tight belt round the chest and difficulty in breathing, induce the belief that he is, or they believe that they are in, an advanced stage of consumption, or suffering from an incurable form of asthma. The pelvic organs are the seat of the trouble in very numerous instances, more especially in young men, and in women after forty. Thus a male patient will imagine himself to have become impotent, perhaps shortly after he has engaged himself to be married, and may commit suicide on the eve of matrimony. Or he may be troubled by anxious feelings about the consequences of early masturbation, gonorrhœa, or spermatorrhœa, and he may go from one surgeon to another to be sounded for stone in the bladder, when no stone exists. A woman may, on the other hand, be subject to such painful sensations in the womb that she comes to imagine herself to be the victim of uterine cancer, and consults one gynecologist after another with the view of having an operation performed.

Some cases are met with in which distress is felt from time to time in all parts of the body, without fixing itself habitually in any special spot. Such patients complain at the same interview of pain and heat in the head, throbbing in the temples, difficult articulation, choking in the throat, palpitations, discomfort in the right or left hypochondrium, pain and soreness in the bladder, numbness and aching in the limbs, etc., and may express their belief that they have, or are going to have, a fit of apoplexy, heart disease, aneurism, gastric ulcer, consumption of the bowels, rheumatism, fever, Bright's disease of the kidney, stone, and enlargement of the prostate.

Hypochondriacal Feelings not Imaginary.—An unprejudiced observation of well-marked cases of this kind must lead us to the conclusion that the distressful feelings which are complained of by such patients, and described by them with the utmost minuteness and the most wearisome reiteration, month after month, and year by year, cannot be owing simply to imagination, as is often too readily assumed by the relations and medical attendants of the sufferer, but must have a substantial base in fact. When incessant complaints are made, and the doctor on examination does not discover any objective symptoms, he is after a time inclined to disregard the trouble altogether; while the friends of the patient finding that, in spite of all the horrors which he is never weary of describing to them, he does not really get much worse in the course of time, harden their hearts to him and tell him plainly that he is putting it on, and that if he would only rouse himself and pull himself together he would soon be all right again. Nothing is more apt to make the patient angry than to be told that his troubles are

imaginary, and he will reply that he is not a child, but knows perfectly well what he is about and what troubles him. Such persons are indeed really ill, and it is as impossible for them to get better by "pulling themselves together" as it would be for a patient with tic douloureux to feel no pain, or for one with cystitis to pass normal urine. One cannot get rid of a disease simply by desiring or being willing to do so. Moreover, what object would be gained by these people through their incessant tedious complaints? They almost invariably become in course of time a nuisance to their friends and doctors, which led Portal to say that while hypochondriasis was hell for the patient, it was purgatory for the physician. Indeed, after a long interview with a hypochondriac—and he takes care that it should be long—the doctor sometimes feels almost as badly as the patient. The knowledge that he is a trouble to everybody who comes in contact with him cannot afford him any satisfaction; nor is it possible to explain by the assumption that such patients are simply "putting it on," why they should commit suicide, which they do sometimes in order to escape from sufferings which to them are well-nigh intolerable. One of the first to lay proper stress upon the sensations of the hypochondriac being real and not imaginary was Brachetsen, who had experienced a number of such feelings in his own person, and was, therefore, peculiarly qualified to give an opinion on this point. Nevertheless it is not at all uncommon to find that the complaints of these unfortunate persons are disbelieved and ridiculed.

Course of the Disease.—Where such harassing sensations as I have described are almost constantly present, the patient's character and disposition naturally undergo in course of time a complete change. The incessant distress he feels makes him sullen, morose, peevish, crotchety, irritable, and, above all, utterly selfish and inconsiderate to others. Being firmly convinced that he has some incurable and mortal illness, which appears to him unexampled and extraordinary, he eventually can think of nothing else. He is apt to weigh every particle of his food and drink; he examines his expectoration, sweat, urine, and feces, which he insists on submitting to his doctor, and holds forth about all these matters to his friends, or even strangers, without the least compunction or reserve. He is always in a state of despair, believes his end to be near, says that he will be glad to die, and, while fearing death more than anything else, may commit suicide on a sudden impulse. In consequence of his being in an incessant state of fear and alarm the vital functions are after a time improperly performed. Digestion and assimilation suffer; the mouth becomes dry; the tongue appears covered with a white, tough, tenacious mucus; there are constant hawking and belching (hence the old term, *morbus ructuosus* or *flatuosus*); the stomach may become dilated and the liver congested; the bowels are habitually constipated, and piles often make their appearance; the circulation also

suffers; the pulse is slow, irregular, and intermittent; there is throbbing in the epigastrium, which may be seen and felt; the skin is rough and dry, the complexion yellowish or brown (hence the term *morbus niger*); the face pinched and hollow, the body wasted (hence the term *morbus resicatorius*); the urine dark and scanty or colorless and abundant, while insomnia becomes more troublesome as time goes on.

CAUSES OF HYPOCHONDRIASIS.—The course of the disease is apt to be protracted and severe where it is chiefly owing to neurotic inheritance; and comparatively short and slight where the predominant influence in its production has been exerted by exciting causes which have a prejudicial influence on the nutrition of the nervous system. Such causes are principally a sudden shock, domestic grief, loss of relations, crossed love, impaired social position, change from affluence to poverty, disappointed ambition, undue mental and physical strain, alcoholic and sexual excesses, the habitual abuse of purgatives, narcotics, and analgesics; certain acute infectious diseases, especially influenza and long-continued gastric and hepatic troubles. To these should be added gonorrhœa and sexual irregularities in men, and chronic leucorrhœa, menstrual derangements, the puerperal state, and the menopause in women. The neurosis is also apt to come on in women shortly after they have become engaged to be married, and after certain gynecological operations; sedentary habits and the reading of medical books, especially those issued by the quack fraternity, are likewise of influence. In cases where no exciting causes can be discovered the hypochondriasis has to be looked upon as purely constitutional. This is the worst form of the disease; it is rarely if ever cured, more especially when affecting patients of an advanced age, and is apt to end fatally after a protracted period of marasmus. Where, on the other hand, exciting causes have played the principal part in its production, we have to do with the accidental form of hypochondriasis, which offers a far more favorable prognosis. In this form, however, there is always a certain amount of predisposition as well; for many persons go through a protracted and painful illness, and through fearful troubles as well as excesses in life, without ever becoming hypochondriacs; and it is therefore necessary for this condition to be established that the imagination should be impressionable and easily affected by morbid sensations, so as to be induced to transform feelings into maladies, and thus to create diseases which have no real existence. This neurosis is most frequent between twenty and forty years of age, probably because the factors which are apt to produce it are then more active than at other periods of life. It occurs, however, occasionally in children and the aged. Men are more subject to it than women, the proportion in my practice having been about 70 per cent. for males and 30 per cent. for females, while about the reverse percentages for the sexes appears to prevail in hysteria. In some

few cases the neurosis eventually merges into hypochondriacal insanity and dementia, while in others death may take place by intercurrent diseases, such as bronchitis or typhlitis, or by suicide.

CEREBRAL LOCALIZATION: THE VISCERAL CENTRE.—The symptoms of hypochondriasis have by many of our predecessors been ascribed to a faulty condition of the blood or humors, and by others to disease of the abdominal organs, more especially the spleen, liver, and stomach. No proofs for these assertions have been forthcoming, and Sydenham was the first who sought their origin elsewhere, stating that they arose "from an unequal distribution and rushing about, or ataxy, of the animal spirits." Translated into the language of the present day this means that hypochondriasis, being a disorder of the nervous system, it remains for us to see whether we can localize the seat of the disease in any special department or centre of the nervous system. The primary symptoms of the neurosis may be looked upon as disturbed sensations in the viscera of the body, and everything leads us to believe that for these, as for all other functions, there exists a special cortical centre. The so-called sensory-motor area in the brain, which is situated in the Rolandic convolutions, contains a regular series of definite and more or less strictly localized centres for motion and sensation of the thigh, leg, foot, and toes; of the head, eyes, face, tongue, and throat; and of the shoulder, elbow, wrist, and fingers. A normal condition of these centres imparts to us the proper feeling, and also the sense of power which, when in health, we have in all the voluntary muscles of the body; while an organic lesion or a functional disturbance in the sensory-motor area will lead to feelings of numbness, tingling, "pins and needles," and other abnormal sensations in any of the parts which are under the control of these convolutions. A similar centre unquestionably exists for the viscera of the body, regulating their organic sensibility. A normal condition of this centre would impart to us the feelings of happiness, comfort, and well-being which we experience when in health, and more especially when we are engaged in some mental or physical action which we enjoy, such as making a successful speech to a sympathetic audience, playing a game of skill in which we may be proficient, rowing, swimming, riding on horseback on a spirited animal, singing when we feel in good voice, etc.; here would also come in the feeling of satisfaction which we experience after a thoroughly good dinner, or after a comfortable act of defecation, urination, etc.; while, on the other hand, a disturbed condition of this centre would naturally lead to the perception of a great number and variety of odd, unpleasant, and distressing sensations, the peripheral perception and localization of which would be dependent upon the precise portion of the visceral centre which may happen to suffer, leading to nasty feelings in the head, heart, or lungs, or in the abdominal and pelvic viscera. Ataxy, to use Sydenham's expression, of the centre

in toto would bring about that general form of hypochondriasis of which I have spoken, and in which the entire visceral sensibility seems to be disturbed. Again, we may assume that the *degree* of the peculiar feelings which trouble the hypochondriac will be proportional to the intensity of the disturbance affecting the centre in question.

The centre whose functions I have endeavored to describe undoubtedly exists, although its precise seat has not yet been ascertained. Some physiologists consider that it may be situated in the gyrus fornicatus, while others seek it in the occipital lobes. In connection with this point I would remark that there still exists a large latent zone in the cortex, more especially of the right hemisphere, with the functions of which we are as yet quite unacquainted. Neither experimental physiology nor morbid anatomy has as yet given us any exact clues to the functions of this latent zone, and in some portion of which the centre for visceral sensations may eventually be discovered. Up to the present time no pathological lesions have been found in the nerve-cells of the cortex in cases of hypochondriasis, although the extreme obstinacy of the symptoms in many cases would lead us to think that finer examinations of certain areas of the cortex, by Golgi's and Ramon de Cájal's methods, might, perhaps, reveal certain morbid changes, such as reversion to the fœtal type, or perhaps an extremely insidious form of sclerosis, which might account for the more obstinate and intractable forms of the disease.

NOSOPHOBIA.—Nosophobia presents an altogether different clinical aspect. In this condition there are no painful or perplexing sensations referred to any of the bodily organs, but the distress is purely mental, being the fear of some malady which the patient believes will overtake him. The definition which Mendel has given of hypochondriasis, as "a functional disease of the brain, the essential symptoms of which are fear and apprehension regarding one's own body," applies, therefore, rather to nosophobia than to hypochondriasis. A further striking difference between the two morbid conditions is that nosophobia is essentially transitory while hypochondriasis is apt to be long continued, and is, indeed, frequently permanent. During the last great epidemics of influenza I have met with a number of exquisite cases of nosophobia, that is, the fear of catching the prevailing infection. This condition lasted only as long as the epidemic remained at its height.

A patient who has been off and on under my care for various manifestations of encephalasthenia, came to me one morning in a state of great terror and alarm, saying that he had been unable to do anything or to sleep "for fear of getting the influenza," and asked me to give him a prescription for a preventive medicine. I did so, and joined with it such suggestions as appeared to me appropriate. He was then quite himself again for a few days, when one of his domestics was taken ill with the prevailing malady. This gave a fresh start to the

nosophobia, and he became so upset that he left his home and took rooms at a hotel—by-the-way, the worst thing he could have done under the circumstances. A few days afterward he suddenly left London and went to a seaside place, which at that time enjoyed the reputation of being free from the epidemic. He did nothing else there all day long but read the accounts of the progress of the epidemic in the newspapers, and felt utterly wretched and unfit for anything all the time. When the epidemic subsided he returned to town and laughed about the unnecessary fuss which he had made. Since that time he has had similar short panics about catching whooping-cough and chicken-pox, which had broken out in his family, but has otherwise been quite well and able to enjoy life.

Similar cases have occurred at all times during the prevalence of great epidemics, more especially when there was a cholera-scare. Nor is such a condition altogether insignificant or unworthy of our attention, for persons have occasionally died of it.

Syphilophobia.—Apart from epidemics, nosophobia is chiefly seen in men who have acquired syphilis. In them the appearance of an acne-pustule on the sternum, or a slight laryngeal catarrh, or a feeling of soreness in the tongue, frequently leads to a short attack of nosophobia, or, as it is sometimes called, syphilophobia. The syphilophobist, however, is by no means always a hypochondriac, for he may be quite well and hearty when there are no such or similar exciting causes of fear as I have just mentioned. Indeed, he speedily forgets his troubles when assured by his physician that the symptoms which have alarmed him are of no consequence and have no connection with the diathesis from which he previously suffered.

Cases of disease occurring in some prominent person, and much discussed in the newspaper press, are likewise apt to give rise in neurotic individuals to temporary attacks of nosophobia. When the late Emperor of the French was operated upon for stone by Sir Henry Thompson, the case was very largely discussed in the daily papers, and numbers of persons were seized with the fear that they might have, or were going to have, stone in the bladder. Similar occurrences came under my notice when the case of the late Crown Prince of Germany attracted so much public attention; and I have quite recently seen a case owing to the reports which were being published about the illness of the Czar of Russia. Such things die a natural death as soon as public attention is diverted from that which gave rise to them, but while they last, they are often a source of great misery to those who are thus easily influenced.

It is therefore plain that the attack of nosophobia is always owing to some definite exciting-cause. When no such causes are active the patient is usually quite rational, and not at all moody or depressed; but where predisposition for it once exists the least unusual sign which

may show itself in any part of the body may suffice to set the nosophobic machinery into motion. A congested conjunctiva, a little bleb on the tongue, a slight rash, a cough, a pain in the side, may make such a person quite wretched for the time being, because he fears that he will be seriously ill and may die. As soon, however, as the symptom which alarmed him has disappeared, or when the doctor has succeeded in calming his apprehensions by promising the speedy removal of the trouble, the patient generally forgets all about it, and feels quite well and happy again.

THANATOPHOBIA.—Closely connected with nosophobia is a morbid fear of death by which some persons are troubled all their lives. For this condition Michéa has coined the truly barbarous name of Necrophobomania, and considers that this fear of death constitutes the essence of hypochondriasis. This is a complete misconception, as there are numbers of persons who live in constant fear of death without being at all hypochondriacal. Many aged people, for instance, have habitually a fear of death, without being subject to those distressing sensations which we have found to be characteristic of hypochondriasis, and without unduly brooding over the state of their health. For necrophobomania the term *thanatophobia* should be substituted, as more expressive and euphonious. Thanatophobia is not infrequently met with in young persons who are convinced that their death is at hand and that nothing can save them. I have known a young man who for years never went to bed without thinking that it was going to be his last night, and who took every night, mentally, leave from his friends and belongings. In some of these cases vicious habits contracted in early life have seemed to produce this condition, while in others no exciting cause could be discovered.

INFLUENCE OF SUGGESTION.—A further difference between hypochondriasis and nosophobia is that suggestion has generally little or no influence on the former and a powerful effect on the latter condition A nosophobist who is afraid of having disease of the liver, because he has felt pain in the region of it, is, after a careful examination of that organ, delighted with the doctor's assurance that there is nothing serious the matter with him, and presently forgets all about it. An unfavorable prognosis, on the other hand, may drive such a man to despair.

A patient of mine who had had protracted gonorrhœa thought that he might have stricture, and consulted surgical authorities about this point from time to time. His urethra was perfectly sound, and he had been repeatedly assured that he had no stricture. On one such occasion, however, an eminent surgeon who happened to be out of temper, told him roughly that, although he had no stricture, he had the nearest thing to it. This gave the patient a terrible shock, and as he considered his case to be hopeless, he determined to commit suicide. For weeks subsequently he required strict supervision, but eventually

calmed down after repeated assurances that the opinion which had upset him so much was not seriously intended.

An unfavorable prognosis has hardly ever such an influence on the hypochondriac. On the contrary, such a patient is often quite pleased with it, partly because it corresponds to his own feelings of profound illness, and partly because he can boast of it to his friends, who may have expressed doubts about the reality of his sufferings. Nevertheless I consider it wrong to give a hopeless prognosis even in confirmed cases of hypochondriasis, as is often done, not only because we should consider the patient's feelings, which may be still further depressed by such an opinion, but also because, even in apparently desperate cases of that disorder, an improvement, and even a fair amount of recovery, may take place. A favorable prognosis, on the other hand, has little or no cheering influence on the hypochondriac, because he is so much distressed by the incessant painful sensations to which he is subject, and habitually finds so little relief from the various modes of treatment which are used in his case, that he is quite convinced of the incurability of his illness, and considers a doctor who promises to cure him to be ignorant and presumptuous. But although our efforts to relieve the hypochondriac are so frequently unavailing, the doctor's visits have often, all the same, a good influence, for the patient is generally a little happier afterward from having relieved his mind to a sympathetic listener. Another difference between the two conditions is that the subject of nosophobia has absolute and unquestioning faith in his physician, and follows the prescribed treatment in the most punctual and systematic manner, while the hypochondriac has generally a poor opinion of medicines, and frequently refuses to take those which have been ordered for him. He often says that most drugs are too strong for him, and more likely to do him harm than good. He therefore generally shirks taking his dose, and I have often thought that medical treatment might produce a better effect in such cases than it usually does if it were more strictly followed.

TREATMENT.—There is no specific for hypochondriasis, and Bronner's remark, "Magnus mihi erit Apollo qui hypochondriacum ad sanitatem reduxerit," is as true now as it was two hundred years ago. Nervine tonics, such as arsenic, strychnine, phosphorus, and others, have generally only a temporary effect, while sedatives, such as bromides, hyoscyamus, and opiates, are habitually disappointing in their action. The constant galvanic current, which does so much good in encephalasthenia and some forms of hysteria, does not appear to benefit the hypochondriac in the same manner. Moral and hygienic treatment, indeed, often does more good than drugs. It is important to cheer the patient up with the hope of eventual recovery from his troubles, which indeed may happen after years of misery. Frequent change of air and scene

and distraction by society are useful. It is essential to see that the secretions are kept in good order, and to enjoin great moderation in eating and drinking. In some patients a purely vegetarian or milk diet will do good; and in very obstinate cases a seton or issue in the arm may be used. A very influential agent in combating the hypochondriacal condition is active exercise; and amongst the various forms of exercise I would recommend bicycling and tricycling for the young, and riding on horseback for those somewhat more advanced in life. The exhilarating effects of the latter form of exercise are well described by one of our ablest novelists, who says: "I know few counsellors more exhilarating than a spirited horse. I do not wonder that the Roman emperor made a consul of his steed. On horseback I always best feel my powers and survey my resources; on horseback I always originate my subtlest schemes and plan their ablest execution. Give me but a light rein and a free bound and I am Cicero—Cato—Cæsar; dismount me and I become a mere clod of the earth, which you condemn me to touch; fire, energy, ethereality have departed. I am the soil without the sun, the cask without the wine, the garments without the man." Let us, therefore, by all means insist on this excellent practice being pursued by our hypochondriacal patients.

THE OPERATIVE TREATMENT OF HERNIA.

By W. S. Halsted, M.D.,
PROFESSOR OF SURGERY IN THE JOHNS HOPKINS UNIVERSITY, BALTIMORE.

The problem is to close durably a rent in the abdominal wall and to provide for the safe transmission of the spermatic cord. The cord is the first cause of the hernia and the ultimate obstacle to its cure. If we could ignore the cord, the solution of the problem would be comparatively easy. The larger the cord the greater the liability to a recurrence of the hernia. The size of the cord depends chiefly upon the veins. Then why not reduce the size of the cord by excising such veins as may be superfluous? By this procedure the cord may usually be reduced to less than one-third, and sometimes to one-fifth or one-sixth of its original size. Two quite distinct sets of veins accompany the vas deferens. When the tunica vaginalis propria funiculi spermatici has been divided and the elements of the cord are gently spread out by the fingers the larger superfluous bundle of veins lies at some distance from the vas deferens. A few very delicate veins hug the vas deferens closely. The veins which we designate as "superfluous" are those which I regularly excise in operations for varicocele. We have not thus far

seen atrophy[1] of the testicle follow excision of these veins. Our cases have been observed with especial reference to this point. I think that there can be little doubt as to the advisability of reducing the size of the cord by excising these veins when they form a large bundle.

Let us consider next the closing of the hole in the abdominal wall. What tissues shall we employ and how shall we bring these tissues together? It has been demonstrated too often that the stitching of the pillars of the ring does not suffice. We must do more than bring free edges of the aponeurosis of the external oblique muscle together. Fortunately we have muscles so near at hand and so placed as to suggest at once a simple, and what has proved to be an entirely effective, plastic operation. After cutting through the anterior wall of the canal down to the sac, we continue the incision in the same line, outward and a little upward, through the internal oblique and transversalis muscles for an inch or less. We divide the muscle-bundles about at right-angles to their long axes. Thus two flaps of muscle are obtained, which we draw down into the canal and include in the deep stitches in the way to be described. The uppermost bundles of the cremaster muscle are often so heavy that we can use them for the same purpose. We close the rent which Nature has made and which the knife has enlarged with mattress-sutures, precisely as we close all abdominal wounds. The mattress-suture is to be preferred to other sutures because it constricts the tissues less, holds greater surfaces in contact, and insures, ultimately, more accurate apposition of the several planes of tissue. These stitches bring surfaces together at the outset, just as in sutures of the intestines the walls of the intestine, irrespective of the stitch, are always brought together. The walls of the intestine are so inverted that the muscular surfaces (so-called peritoneal surfaces) are extensively in contact, the cut edges never. And yet after a few weeks no trace of the inversion remains. Sometimes an almost imperceptible dark line is left to indicate the position of the cicatrix. With the aid of the microscope we see that the finest layer has met its fellow and may be traced uninterruptedly through the cicatrix, and were it not for the rudimentary character of a few of the villi we might search in vain for evidence of the solution in continuity.

Dr. Mall,[2] for whom I performed some experiments which necessitated circular suture of the intestine, describes the microscopical appearance of an intestinal suture of sixty-four days as follows: "Fig. 12 shows a section of this suture which strikes the stitches. Were it not for this stitch and a slight infiltration of that part with leucocytes the point of

[1] May 15, 1895. In three of our cases atrophy of the testicle has been caused by the operation. The atrophy is probably due to the excision of the veins, for it has occurred thus far only in the cases in which the veins were excised.—W. S. HALSTED.

[2] Johns Hopkins Hospital Reports, vol. i. p. 90.

suture could not be made out. To be sure, the microscope shows very rudimentary villi which could easily be overlooked when compared with the other folds which this intestine contains. The crypts are fully regenerated and cannot be differentiated from the surrounding crypts. The stratum fibrosum, muscularis mucosæ, submucosa, and two muscular coats are all reproduced and form one straight line. The regeneration is so complete that the two layers of the regenerated muscularis mucosæ can be made out."

There are usually six of these deep stitches. They are taken very close together, not more than 1 cm. apart. The two arms of each stitch are 7 or 8 mm. apart. The vas deferens, with its arteries and remaining veins, is brought forward between the two outermost stitches. These two stitches are closer together than the others and embrace the cord snugly. The outer arm of the outermost stitch is sometimes passed through uncut muscle.

When the deep wound is closed muscle should be seen throughout the greater part of it, projecting between the cut edges of the aponeurosis of the external oblique muscle. These edges are then made to embrace the cord more snugly at the point where it passes between them by two very fine stitches. The skin-incision is closed with an uninterrupted suture. As we approach, in stitching, the lower inner angle of the deep wound the muscle becomes thinner and finally gives out. The aponeurosis of the external oblique, with perhaps a few fibres of the cremaster, is all that is left for the innermost stitch. If the aponeurosis at this point shows, as it sometimes does, a tendency to split when it is vigorously pulled upon by a stitch, we gather or pucker it up by taking running mattress-sutures in place of the ordinary mattress-sutures. In running the stitches I try to avoid perforating the aponeurosis. The puckering is, of course, only a temporary affair, but the running stitches enable us to close the lower angle of the deep wound with less damage to the aponeurosis.

In short, we close our hernia-wounds precisely as we close all wounds of the abdomen, except that in hernia alone we stitch the peritoneum separately. In wounds of the linea alba we split the sheaths of the recti muscle, whether we are operating for the cure of hernia or not, that we may oppose broad surfaces of muscle throughout the whole length of the incision.[1] For the same reason, and also that we may transplant the cord in the male and the round ligament in the female, we divide the internal oblique and transversalis muscles when operating for the cure of inguinal hernia.

[1] In a recent number of the Centralblatt für Chirurgie, P. Bruns, of Tübingen, describes and recommends a method for the cure of ruptures in the linea alba which, except that he does not employ the mattress-sutures, is identically ours for closing all incisions in the linea alba.

I shall say but a few words at this time about our results, for Dr. Bloodgood will soon publish a complete report of them.

We have operated one hundred and sixty-five times for the cure of various forms of hernia in both sexes without a death from the operation. One hundred and six males with inguinal hernia have been operated upon by my method. The wounds, with few exceptions, have healed absolutely *per primam*. Thus far we have been unable to find a single recurrence in cases whose wounds healed *per primam*. The case which furnishes the nearest approach to a recurrence was operated upon about three years ago and is now under daily observation. The man has the physiognomy of a Hindoo, but is classed as a negro. He is about thirty-five years old, not much more than half-witted, and was on admission, and still is, much emaciated and exceedingly feeble. Within the first twenty-fours he got out of bed. Possibly he repeated this act of disobedience daily. The wound healed absolutely *per primam*. There is at present, but only on coughing, a bulging of the very thin, flabby abdominal wall from the inner almost to the outer end of the scar. The local condition is not bad enough to demand a second operation.

I dislike to have my operation referred to as a modification of Bassini's operation. The operations are undoubtedly original with both of us, and mine was described several months before we had heard of Bassini's operation. You may know that in my operation the cord which is transplanted out into the thicker muscle lies superficial to the aponeurosis of the external oblique muscle, and not, as in Bassini's operation, in a fold of and under this aponeurosis. In Bassini's operation the circulation of the aponeurosis must be impaired, both by the foldings of the aponeurosis near Poupart's ligament and by the stitches which temporarily maintain them. Furthermore, Bassini's method does not, as he claims, re-establish the obliquity of the canal. Bassini believes that he restores the inguinal canal to its physiological condition when he makes "a canal with two openings, an abdominal and a subcutaneous opening, and with two walls, a posterior and an anterior, through the middle of which the cord passes obliquely." But the original canal is not by any means an affair so simple as Bassini's. To reproduce the equivalent, anatomically and physiologically, of the inguinal canal is for us impossible.

For about one year I have sewed all of my hernia-wounds with silver wire and have covered them with silver-foil. Without exception the wounds have healed absolutely *per primam*. Not a single stitch-abscess has been observed either during or subsequent to the healing of the wound. Such absolutely perfect healing of the hernia-wounds we have not had heretofore, and I am convinced that the use of silver as a suture-material has contributed somewhat to this result. We have tested the

effect of silver on the growth of the more common pyogenic organisms. I have here two Pétri-plates which Dr. Bolton has kindly prepared for me. They have both been inoculated with staphylococcus pyogenes aureus. In the centre of each plate is a piece of silver-foil, such as we use on our wounds. Just outside, and completely surrounding the foil, is a perfectly clear zone several millimetres wide. Except for the clear zone and a slightly intensified zone just outside of this, the agar is quite uniformly cloudy. The cloudiness is due to the growth of the micro-organisms with which the agar has been inoculated. Dr. Bolton has studied the effects of various metals on the growth of bacteria, and has recently read a most interesting paper on this subject before the Association of American Physicians. With cadium, zinc, and copper, Dr. Bolton observed that the inhibitory action was greater than with silver. Prior to my knowledge of Dr. Bolton's experiments I tried to use copper and brass foil for protective, and copper and brass wire for sutures; but these metals corroded the tissues so much that I soon stopped using them. We do not hesitate to employ buried sutures of silver wire in sewing tissues on the confines of an infected region. In cases of acute suppurative appendicitis, for example, we close the wound in the abdominal wall with deep, interrupted, buried sutures.[1] These wounds are drained by a few strips of gauze. Two of the sutures are taken very close to this gauze, and sometimes must pass through tissues which are infected. Not even in such cases have we ever had a stitch-abscess. Once a silver stitch and once a silver bone-plate, having been exposed to view and to the air by necrosis of the overlying tissues, were allowed to remain and to become imbedded in the ganulations of the wound, which healed by suppuration. Neither the stitch nor the plate at any time caused the slightest disturbance in the tissues or inconvenience to the patient.

We have already observed much in the use of silver wire that is worth recording and enough to satisfy us that it will play a new and more important *rôle* in the surgery of the near future.

THREE CASES OF DERMATITIS HERPETIFORMIS DUE TO PREGNANCY (HERPES GESTATIONIS).

By George T. Elliot, M.D.,
of new york city.

The number of cases of the herpes gestationis of Milton and Bulkley recorded in literature is not so great that the report of further ones need be useless. Up to 1888, Brocq[2] was only able to collect some

[1] Vide Bulletin of the Johns Hopkins Hospital, November, 1894.
[2] Brocq: De la Dermatite herpetiforme de Duhring. Paris, 1888.

twenty-two, and since then I have not been able to find more than ten additional examples of the process. Among these latter is one which was reported by me in 1892, in connection with some other cases of dermatitis herpetiformis of uterine origin,[1] and I classed it with that disease instead of regarding it as an instance of a separate and distinctive process. Duhring had previously claimed that herpes gestationis was only a phase of the dermatitis herpetiformis first described and differentiated by himself, and Brocq had ably supported that position in his *résumé* of the entire subject, so that I was thus in entire agreement with them. The case I referred to furnished, moreover, so strong a proof of the position taken that Brocq, in reviewing it in 1893,[2] stated "it seems difficult now still to make two entirely different diseases of dermatitis herpetiformis and of herpes gestationis." This case was characterized by being the first one which, possessing all the requisites for the diagnosis of herpes gestationis, yet persisted, contrary to the course of all others recorded, continuously for several years from its primary inception, and in the entire absence of any new pregnancies and during its existence, presented, moreover, none but those symptoms belonging in a greater or less degree to every case of dermatitis herpetiformis, of whatever origin or from whatever cause. The following examples of the process are reported as "dermatitis herpetiformis," and not as "herpes gestationis," in view of the opinion expressed; and one of them shows, although in a much less degree, much the same tendency to persistency for a long period of time after termination of the first pregnancy, as did the case reported by me in 1892.

Case I.—Mrs. ——, aged twenty-eight years, was seen by me March 9, 1894, in consultation with Dr. Blundell, of Paterson, N. J. The patient had always enjoyed good health, and her position in life enabled her to live in ease and comfort, without worries, anxieties, or other mental or moral shocks. Her first pregnancy occurred in 1888 and ran a natural course. The labor was normal and uncomplicated, but three days after the birth of the child an eruption appeared on the hands and feet. It was accompanied by intense burning and itching, and consisted of bullæ, some as large as a pigeon's egg. Extension took place rapidly and similar lesions appeared over the extremities, but on the body only erythematous blotches were noticed. This eruption gradually subsided, but was followed by others cropping out at variable intervals, made up of vesicles, small bullæ, and erythematous patches, accompanied by intense burning and itching. At the end of a year the cutaneous disturbances gradually declined and disappeared.

In 1891, she again became pregnant and the same phenomena developed, but much earlier—in the sixth month of pregnancy. The process began on the same regions as before, and its morbid manifestations were entirely similar to those seen in the primary outbreak. Great soreness, itching, and burning accompanied the eruption, and insomnia, nervous

[1] Elliot: American Journal of the Medical Sciences, 1892.
[2] Annales de Dermatologie et de Syph., January, 1893.

irritability, etc., were the consequences. During the remainder of her pregnancy the process appeared in successive crops, and after confinement it became exceedingly aggravated. Severe outbreaks continued for four months and then a gradual cessation occurred, though even up to the present pregnancy there would be from time to time slight eruptions of itchy and burning "spots," which would last a few days and then disappear. The patient's third pregnancy began in 1893, and when I saw her she was in the sixth month. She stated to me that the eruption had become manifested even before she knew that she was pregnant. The lesions had been preceded by intense burning and itching, and they had first appeared on the abdomen, and next on the feet and legs. A little later, they had cropped out on the hands and on the arms, but none had developed on the face. The abdomen had been severely affected, but the back had been almost entirely free. The subjective symptoms had been intense from the first, and owing to their being worse at night insomnia, nervous irritability, and general debility had ensued. The itching and burning were, however, not very severe when the patient remained quiet, but the slightest excitement increased her suffering very greatly. When I saw the case the woman was apparently in a good condition of health, though a little anæmic. She was well nourished, her functions were natural, the pregnancy produced no gastric or other disturbances. The renal conditions were likewise unaffected. In fact, the eruption and its entailed discomforts were all she complained of. The lesions consisted of bullæ of all sizes, from a pin-head to a nut; tense, prominent, and filled with clear serum. There were also more or less large groups of vesicles and papulo-vesicles, but no pustules. Here and there were patches of large size, composed of a slightly depressed, pale centre, bounded by an elevated, gyrate, red, urticarial-looking border about a quarter of an inch broad. There were others which were solid, elevated, sharply defined, of a bright-red color, and varying in size from a silver dollar to two or more inches in diameter. Scratch-marks, crusts, and fading blotches were also abundantly distributed between the new and fresh lesions.

Dr. Blundell has kindly informed me that the eruption continued during the remainder of the pregnancy, uninfluenced by any treatment. After confinement, it became greatly aggravated and then gradually subsided, ceasing at the end of about four months. The last report received states that the patient is again pregnant, but no mention is made in regard to the reappearance of the skin affection.

Case II.—Mrs. ——, aged thirty-one years, came under my care March, 1894. She had been married in 1882, and her first child had been born one year later. Between this child and her second one, born in 1889, she had had six miscarriages, but she would not state whether they had occurred spontaneously or had been induced. She was confined of her second child in April, 1889, and the cutaneous process had first appeared in the sixth month of this pregnancy. Synchronously with its inception she had had watery vaginal discharges at short intervals, and these continued up to the time of her confinement. The cutaneous symptoms in this attack consisted primarily of intense pruritus and burning of the palms and soles, followed by the formation of bullæ on the hands and feet, and later on the abdomen around the umbilicus. On these surfaces the eruption remained localized during the remainder of the pregnancy, but after delivery a more or less general

eruption of bullæ, preceded by intense burning and itching, appeared over the body. For four to five weeks afterward these lesions arose in successive crops, and then the process gradually subsided, the patient being at the end of three months entirely free from the cutaneous disturbance.

Between the pregnancy of 1889 and her present one the woman has had two miscarriages—one at five and the other at three months. During these pregnancies no skin symptoms developed. After her last miscarriage she had had severe flooding every two to three weeks up to October 1, 1893, when she says there was only a show. She thought she had felt life in January, 1894. About February 1st the first manifestations of the cutaneous process were noticed in the form of intense itching and of small "blisters" on the palms and the fingers and on the soles, while bullæ appeared around the umbilicus. Their outbreak occurred in successive crops with great rapidity, and she entered Bellevue Hospital in Dr. Brannan's service on February 6th. The eruption became, however, steadily severer in degree and extent, and when I saw her about ten days later in consultation with him the entire cutaneous surface was affected and covered with erythematous patches, groups of vesicles and papulo-vesicles, bullæ, and crusts, while the woman complained of the most intense itching and burning. After leaving the hospital she came to my clinic at Demilt Dispensary about March 1st. On examination she gave me the details of her prior history as I have already enumerated them, stating in addition, however, that previous to her marriage she had been in good health, and that subsequent to it she had felt well and had been able to work, notwithstanding her many miscarriages. She was judged to be pregnant about six months. She was very anæmic and weak and in a very depressed somatic condition. Constipation was marked, a movement of the bowels not having occurred in eight days; the tongue was badly coated, the breath very foul, and complete anorexia existed. The eruption was found to be more or less generalized over the entire body, following, however, no particular rule in its localization. Its primary outbreak had been preceded by an intense burning and itching on the surfaces upon which the lesions originally developed, and this feature was a constant one, occurring prior to every outcropping which subsequently took place. The backs of the hands were occupied by erythematous, irregularly shaped patches, upon which were groups of small crusts, and by papules, single and grouped. Purplish stains were also present as residua of older lesions. The palms were not affected. The arms, over both their flexor and extensor surfaces, were covered to the shoulders with erythematous patches, papules, vesicles, and bullæ, distributed without order or arrangement. The papules, papulo-vesicles, and vesicles were a pin-head to a small pea in size and were arranged in groups. The bullæ were as large as a buckshot to a penny, tense and resistant, with clear, turbid, or purulent contents. Crusts were also abundant, and the arms were in addition mottled with dark-red and purplish blotches, evidences of former lesions.

The face was entirely free, except for one bulla on the chin; but over the thorax there were numerous groups of papules and vesicles and discrete bullæ. A curious phenomenon was noted around each nipple, it being encircled at a distance of about half an inch from the areola by a narrow, slightly elevated, scalloped erythematous band, which formed an irregular ring. The back was thickly covered with groups of vesicles

and papules, with bullæ, crusts, and stains. On the abdomen the papular and vesicular groups predominated, but in the groins there were only large bullæ. The legs and feet presented the same appearances as were noted on the arms.

The mucous membranes were entirely free from the eruption. The patient remained under observation for a month. During that time it was noted that crop after crop of vesicles, papules, and bullæ appeared, subsided, and were replaced by new outbreaks. The pruritus and burning were intense and not ameliorated by any treatment. The patient was lost sight of, and the further course and termination of the pregnancy and the cutaneous process are not known.

Case III.—Female, Russian, aged thirty years, entered the Skin and Cancer Hospital (Dr. Bulkley's service) February 21, 1894. She had always been strong and well; gave no history of syphilis or of any cutaneous disease different or similar to the one she was then suffering from. Her first pregnancy terminated on January 10, 1894, when she had given birth to a full-term, but dead, child. Her pregnancy had been normal, and she was unable to give any traumatic or other cause for the death of the child *in utero*. She stated that three days before her confinement a number of intensely pruritic papules and erythematous patches had appeared over the abdomen. Vesicles developed a day or two after delivery and enlarged rapidly to the size of a buckshot, and even larger. Rupture then took place and the exposed raw, moist surface became crusted over. Rapid extension of the eruption ensued and lesions developed in quick succession over the extremities, the trunk, and the scalp. Similar lesions, always accompanied by intense burning and itching, kept cropping out steadily up to the date of her admission to the hospital, and her general condition deteriorated greatly. What had been the course of the puerperium, whether she had any chills, temperature, localized peritonitis, or other morbid symptoms, could not be ascertained from the patient.

The woman was found on examination to be poorly nourished. The bowels were costive and she could not retain any solid food in the stomach. The tongue was thickly furred. There were no remains of lochia or of offensive discharges from the genitals, no tenderness or sensitiveness of the uterus or pelvic organs. No renal disturbances. Hemorrhoids and a slight prolapse of the rectum were alone noted. The patient was restless and anxious, mentally excited, and somewhat hysterical. Her temperature was 100½°; pulse 110.

The eruption occupied more or less of the entire body. The chest and abdomen were covered with crusts. The major part of the back was raw and denuded of epidermis, but here and there were a few bullæ, about as large as a nut, filled with clear serum. Over the arms, legs, feet, and hands there were a large number of bullæ of all sizes: some recent and tense, others older and flaccid, others already having formed crusts. On the lower half of the legs these lesions had become confluent and their rupture left a raw-looking surface, which quickly became crusted over. There were, in addition to the bullæ and crusts, erythematous patches and a few papular and vesicular aggregations. Many stains and scratch-marks were also present. The burning and itching caused great suffering and were bitterly complained of.

While in the hospital the course of the eruption consisted in a succession of outbreaks of bullous lesions, preceded and accompanied by

intense itching. Her general systemic condition deteriorated steadily; her temperature varied between 99½° and 100°, evening rise and morning fall; she grew weaker and weaker, the stomach refused to retain any nourishment, tympanites developed, and the patient died March 27th. No autopsy could be obtained.

Notwithstanding the differences in degree, mode of inception, and duration of these cases, yet they all show distinctly those clinical objective and subjective symptoms and course characterizing dermatitis herpetiformis in general. Arising in connection with pregnancy includes them in that phase of the disease called herpes gestationis, but in the multiformity of their lesions, the constant relapses and succession of outbreaks, accompanied by intense burning and itching, we find the cardinal symptoms of Duhring's disease, and Case I. appears to me to emphasize this view much in the same manner as did the case reported by me in 1892. It is true that it began only three days after delivery, but that does not exclude it from the category of those cases arising from pregnancy, as similar instances have already been recorded. Besides, the eruption developed earlier in each successive conception, as has been repeatedly observed by others, and in its whole behavior, except its long continuance after confinement, it agreed with those other cases reported in literature. It is, however, in the particular of its long duration after pregnancy that the case is important. In all those previously seen, with the exception of the one I recorded in 1892, the eruption underwent aggravation within the first few days after labor, and then disappeared rapidly in a few days or weeks, rarely lasting two to three months, and it became of a chronic type and of long duration only after repeated attacks occurring in successive pregnancies. In the present case, however, the manifestations of the process continued cropping out in a series of outbreaks for a year after the primary attack, and its tendency to chronicity was furthermore shown, after the pregnancy in 1891, by its continued outbreaks from time to time until the conception in 1893, when it became continuous, and only ceased four months after the confinement in 1894. This sudden termination is certainly curious, but not any more susceptible of explanation, however, than its non-recurrence in the present or last pregnancy. Notwithstanding these latter peculiarities the case in its prior course and behavior appears to me, however, to furnish an additional link connecting herpes gestationis with dermatitis herpetiformis, and to aid in establishing the fact that the former is only a phase of the latter.

In Case II. we see more particularly the usual and typical course of herpes gestationis. Developing in the first pregnancy after her numerous miscarriages, it lasted till the child was born, then becoming greatly aggravated it subsided and ceased altogether at the end of about three months. After a long period of freedom the process recurred in the

pregnancy in 1894. She then came under my care, and the eruption in its objective and subjective symptoms was such that were it not known that conception existed, no other diagnosis but that of dermatitis herpetiformis would have been made. In fact, my experience in studying six personal cases of herpes gestationis, and in comparing them with thirty-five examples of dermatitis herpetiformis originating from causes other than pregnancy, and which have been under my care, would lead me to state that only the knowledge that the patient was a woman with an impregnated uterus would enable the diagnosis herpes gestationis to be made instead of that of Duhring's disease. The former is characterized by having a definite factor—pregnancy—as its determining cause, but I have failed to see how in its course and general symptomatology it differed in any way from those cases arising under the influence of some other cause than that particular one.

Case III. is of interest owing to its fatal termination. The patient's death can, however, not be ascribed to the cutaneous disease, but unquestionably to septicæmia, from which she was suffering when she entered the hospital. It was not possible to determine the starting-point of the septic process, whether from the uterus or from the skin. In whatever way it developed, however, it is probable that the condition of the skin contributed to it, as the raw state of a large portion of the surface, covered with decomposing secretions, crusts, and dirt, certainly favored septic absorption. That the case was one of the same nature as the other two included here seems to me unquestionable, in view of its inception during pregnancy, its aggravation after delivery, the multiformity of its lesions, the course it ran, and the intense subjective symptoms preceding and accompanying its outbreaks. In these cardinal features the case agreed with other examples of this phase of dermatitis herpetiformis, and I have, therefore, included it in this paper.

It cannot, unfortunately, be said that our knowledge has progressed in regard to the mode of origin and production of dermatitis herpetiformis. What systemic conditions favor its development and what changes preside at its inception and outbreak are entirely unknown. We are only able to judge from clinical study and observation of its etiological moments, its course, and its response to every and any disturbance of the nervous system, that it is essentially a dermatoneurosis, controlled in its phases and manifestations by certain changes in the nervous system, of the nature of which, however, we have absolutely no conception, though, owing to the disease being often transitory, often cured, and not accompanied by or developing grave cerebral or other conditions, we are justified in believing that they are probably only functional and not organic. Since I expressed, in former papers, my belief in the neurotic origin and nature of the disease, all the cases coming under my observation have only strengthened that opinion, and

inasmuch as the most manifold causes acting upon the nervous system in one way or another have been found sufficient to produce the same effect—dermatitis herpetiformis—there can be no reason to exclude from the same category the pregnant uterus as a determining cause of the disease, in view of the neurotic disturbances in the economy naturally incident to that condition. Why, however, the effects of these disturbances are expended in one woman upon the skin and in another they are not, are questions awaiting solution, and an explanation for them cannot be at present even surmised.

The treatment of this cutaneous disease does not promise brilliant results nor afford great satisfaction. When it has been possible to discover and reach its basic determining cause entire relief and even a cure have been sometimes obtained by me; but when the medication was purely a symptomatic one I have not seen any beneficial effects derived beyond a certain amount of relief from the subjective discomforts of the patient. Internally, some cases have been benefited by arsenic, others by atropia, or pilocarpine, or nux vomica in large doses, or by alkaline treatment; but I have never seen any two react in the same manner toward any one drug or combination of drugs. Externally, I have obtained more benefit from ichthyol than any other application, it not being surpassed even by the tars. Sulphur, resorcin, salicylic acid, menthol, ergot, etc., have all failed in my hands, and the most reliable has been the ichthyol. Of course, in dermatitis herpetiformis resulting from pregnancy there are no measures indicated except palliative applications, which may relieve the burning and itching. The large majority of the cases ceasing after delivery of the child, matters should be allowed to take their usual course, though instances may arise in which the induction of abortion may be necessary. Such a course would, however, have to depend more upon the complications of the pregnancy and the condition of the woman than upon the discomfort, suffering, etc., produced by the process on the skin. In a case seen by me in consultation some time ago, such a procedure was judged absolutely necessary, in view of the albuminuria from which the woman suffered. The cutaneous disease had been severe from the beginning of the pregnancy, and had caused intense suffering, insomnia, and nervous disturbance, etc. The pruritus subsided in a couple of days after the evacuation of the four months' pregnant uterus, and the lesions disappeared rapidly, the skin being entirely clear in about ten days. Only ir an extreme case, however, would such measures be indicated, and these, fortuaately, are not of every-day occurrence.

14 West Thirty-third Street.

LATE INFECTION IN THE PUERPERAL STATE,

BEING A PLEA FOR THE ROUTINE MANUAL EXAMINATION OF THE INTERIOR OF THE UTERUS AFTER THE COMPLETION OF THE THIRD STAGE OF LABOR.

By Egbert H. Grandin, M.D.,
CONSULTING OBSTETRICIAN, NEW YORK MATERNITY HOSPITAL; CONSULTING GYNECOLOGIST, FRENCH HOSPITAL, ETC.

As a preface to the remarks I desire to make in regard to that interesting and frequently obscure topic, late infection in the puerperal state, I append in abstract the salient points in the history of a number of cases which have recently come under my observation.

Case I.—This case was seen in consultation on the twelfth day after delivery. The woman was a primipara in the better walks of life, and both as regards the medical attendant and the nurse had had the best care that could be obtained. The labor had lasted about fifteen hours and the woman had practically delivered herself. The pelvic floor was practically uninjured and the course of the puerperium up to the twelfth day was in every respect normal. On the evening of this day the patient had a slight chill associated with rise of temperature to 101°. This was the first rise during the puerperal state. The next morning the temperature was 99°, but the woman was listless, had lost her appetite, and the husband, becoming alarmed, requested a consultation. I was selected, and I saw the woman in the afternoon. The temperature was then 101°; the abdomen was soft and offered no special point of tenderness; there was a slight reddish discharge from the vagina, absolutely inodorous. I examined the woman carefully and was unable to detect anything abnormal, except a larger uterus than it is customary to find at this late date in the puerperium, as also more patency of the cervical canal. These factors are, however, purely relative and hardly influenced me in the advice which I gave, which was exploration of the uterus. I gave this advice, although assured by the physician in attendance that the third stage of labor had been completed after a normal fashion. Under complete asepsis the cervical canal was dilated sufficiently to enable me to insert an ordinary oval curette, and a piece of membrane the size of a silver dollar was removed. The uterus was washed out with creolin solution and a strip of gauze was carried to the fundus. This was removed the following day and the constitutional disturbance was ended.

Case II.—This case was seen in consultation on the fourteenth day after normal delivery. The woman was also in the better walks of life, and I was familiar with the capability both of the physician who attended her and of the nurse. The course of the puerperium had been normal in every respect and the woman was out of bed, the physician having practically discharged her. She had a chill on the afternoon of the fourteenth day, followed by rise of temperature to 102°. I saw her

[1] Read by title before the American Gynecological Society, May, 1895.

that evening and found everything normal except a larger uterus than it is customary to find at this date after delivery. The cervical canal was open to the tip of the finger and there was a stale odor to the slight lochial discharge. I advised immediate exploration of the uterus, and we removed a piece of placenta about three inches square, although the physician had carefully examined the placenta on delivery and had found it intact. This woman's constitutional symptoms were also promptly checked by the curetting, or rather by the removal of the cause.

CASE III.—This case was seen in consultation on the tenth day after delivery at term. The labor had been terminated artificially and the pelvic floor had been damaged, but this lesion had been at once repaired. The stitches had been removed on the seventh day and good union had been secured. The course of the puerperium was normal up to the evening of the ninth day, when the woman had a sharp hemorrhage which was checked by the hot intrauterine douche. The next morning I was requested to see her, as there was a rise of temperature to 102°, this being the first rise since delivery. The size of the uterus again attracted my attention, and on examination of its interior I found a piece of placenta with a decidedly necrotic odor adherent at the left cornu. This was removed and the uterus was irrigated with bichloride solution, after which it was packed with gauze. The next day the woman had no temperature; there was no odor to the vaginal dressing, so the gauze was removed and the uterus was again washed out with bichloride solution. The woman had no further trouble.

CASE IV.—This case occurred in my private practice. The woman was a multipara whom I had attended in her previous confinement. There was nothing of note about the labor, which was spontaneous. The placenta and the membranes were intact and practically delivered themselves. The course of the puerperium was absolutely afebrile. The woman was allowed to rise from her bed on the eleventh day, and on the fourteenth I called to discharge her. I then examined her and found the uterus larger than it should have been, but I laid no stress on this because this woman had always had a large uterus since I first made her acquaintance. Two days afterward, that is to say, on the sixteenth day after delivery, I was sent for in the evening because the woman had had a chill. I could not reach her until the following morning, when I was told that a neighboring physician had been called in and had pronounced the case one of malaria and had ordered large doses of quinine. Notwithstanding this medication my patient looked badly and felt decidedly so, her temperature being 101° and her pulse 120. Being skeptical about the malaria, I returned in the afternoon and carefully explored the interior of the uterus. To my great surprise I removed a large piece of membrane the size of a goose egg and a material which looked very much like placental tissue, but which was thrown away before I had a chance to investigate it. This woman was mildly septic for a few days, but then convalesced rapidly, and to day enjoys excellent health.

I could multiply other instances which I have seen of this character, but sufficient is on record to enable me to present certain conclusions which have been forced upon me and to advocate a different, or rather a somewhat more radical, method of completing the third stage of labor than is customary.

It is the accepted view to-day that, barring very exceptional instances, septic infection in the puerperal state is the result of faulty technique. The recognition of this view has to a greater extent than anything else led to betterment in our mortality and morbidity rates. It is not the antiseptic agent which is used, it is not the kind of occlusion-pad which is applied post partum, which secure for our patients the uniformly afebrile convalescences which have become the rule in hospital as well as in private practice. Without entering into unnecessary explanations, sufficient here the statement that our results are due to the recognition of the fact that the lying-in woman should not be allowed to exhaust herself in the attempt to accomplish the impossible; that is to say, we watch more carefully in order to assist Nature when she gives evidence of inability to deliver unaided, and, above all, we exercise the most scrupulous care to keep from the woman in labor those elements of infection which were responsible for the disgraceful mortality of the past. And yet, as is evidenced by the cases which I have outlined above, every now and then instances crop up where, notwithstanding all our faithful care and scrupulous cleanliness, septic infection sets in, and this, too, at a late date, when ordinarily the woman is supposed to be free from the risk of any untoward occurrence. The course of labor is conducted aseptically; the puerpera is properly cared for during the puerperium after skilled attendants have thoroughly satisfied themselves that the act of delivery has been complete, as regards the absolute emptying of the uterus. Notwithstanding all this the phenomena of septic infection set in, and that speedy and careful investigation which modern methods of obstetric practice require reveal the source of infection to be a portion of membrane, or even of placenta. How can this be avoided is the question which I propose to discuss here.

For ten years I have been contending that the act of labor should not be considered as having been completed until the uterus has been entirely cleansed of placenta and of membrane, even though these be present only in shreds. This contention has been repeatedly criticised by colleagues, and the assertion, true in the abstract, has been made that these remnants will be shed in the lochia, and rarely, if ever, do damage. My teaching, however, all along has been that, if there were a reasonable doubt as to the integrity of the membranes or placenta, the proper course to pursue was to insert the hand into the uterus, since, while freely willing to grant that these remnants might not do harm, they occasionally did—indeed, might always be the source of future damage—and that it was a far easier matter to investigate the interior of the uterus immediately after labor than to have the procedure forced upon us later in the presence of a greater or less degree of septic infection. Our duty, furthermore, does not end with the puerperal state,

but concerns also the future of the woman we have confined, and her remote health too frequently is imperilled by careless obstetrics. The instances which I have related, and others of a similar nature which I have seen, lead me to even more radical action and teaching, and I bring the argument before you, a body of men who are, above all others, competetent to criticise to advantage.

It will be noticed that in the class of cases I have related there has been no reason to question the condition of the interior of the uterus until a late period after labor. As far as could be certified on very careful examination the placenta and the membranes have been properly shed in these cases, and yet, days afterward, portions of one or the other have been removed. My belief is that cases of this character are far from infrequent, and that the remnant often does not give rise to trouble until at a much later period after delivery than in those cases of which I have spoken. I question if many cases of fungous endometritis, which are diagnosticated a number of months or years after delivery, be not due to the leaving of particles of placenta or of membranes in the uterus. These particles are not shed in the lochia; they give rise to no constitutional disturbance whilst the woman remains under the care of the man who delivered her, or the disturbance is of such a slight nature as not to attract attention. In course of time an endometritis sets in which shows itself in a leucorrhœal discharge or in hemorrhages. At this late date the woman is curetted and the hyperplasia of the uterus which is found is really due or may be traced to an incomplete termination of the third stage of labor. Possibly before the woman is curetted the tubes and the ovaries and the pelvic peritoneum have become affected, and all as a sequence of a similar cause. The fact must be insisted upon that the vast majority of ills to which woman is heir are due to improper, or careless, or ignorant obstetrics. If, as far as possible, the lesions following childbirth were immediately and carefully repaired; if labor were uniformly conducted with due regard to thorough asepsis; if the third stage of labor were terminated as it should be—with a completely emptied uterus—what would there be left for the gynecologist? Very little, all must admit, and this little would depend on causes aside from the function of reproduction and its sequelæ. During the past active years in our specialties men have been too eager to become gynecologists, and too prone to neglect the far more important branch—obstetrics. Our great aim as obstetricians should be to prevent the development of the vast proportion of the diseases which sooner or later send women to us as gynecologists, and one road toward the achievement of this aim is the measure which I advocate here—the manual examination of the interior of the uterus as a routine measure after the expression or the removal of the placenta. Resort to this measure will render impossible the occurrence of cases such as those

which I have pictured to you, and in so far will the woman be spared the possible sequelæ.

I have summarized above the cogent reasons which lead me to advocate this measure. The sole objection which may be offered is the fact that it is necessary to insert the hand into the parturient canal after the third stage of labor has been supposedly completed. How far this objection will hold in these days of rigid asepsis I am perfectly willing to leave to your judgment. In mine, the clean hand inserted into the uterus, under conditions when access to its interior is unimpeded, carries no risk to the woman, certainly none comparable to those to which she may be subject if the uterus has not been cleansed of all remnants.

DIABETES MELLITUS.

By N. S. Davis, Jr., A.M., M.D.,
PROFESSOR OF PRINCIPLES AND PRACTICE OF MEDICINE AND CLINICAL MEDICINE, NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, CHICAGO.

During the last few years as cases of diabetes mellitus have come to me, and as I have watched those under treatment, the impression has grown that there was a seasonal variation in their occurrence and severity which is not mentioned either in text-books or monographs. I was therefore prompted to study carefully the statistics of such cases as I have records of. These amounted to fifty-five in all. About one-third of them have been under observation almost continuously for from two and a half to seven years. Most of them have been seen at least once a month, and during exacerbations two or three times a month. A few gaps of from one to six or seven months have occurred in all those longest under observation. The other two-thirds had been watched closely for from six weeks to six months. In preparing the following, Chart 1, the proportion of times that sugar has occurred in the urine to the total number of observations made on these cases in a given month has been compared. For example, in the Januarys of the last seven years sixty unrinalyses have been made on diabetics, and sugar has been found fourteen times. The relation of positive to negative results is therefore 1.4 to 6.6. Chart 1, prepared in this way, shows the correctness of my impression that there is a seasonal variation in the occurrence or recurrence of glycosuria. As will be observed on the chart, glycosuria has occurred three times as often in March and April as in January, four times as often in July, and a little more than three times as often in November. It occurs least frequently in December, January, and February. It is notably less common in May than in April or July. Its frequency of occurrence is seen to diminish during

August, September, and October, culminating in the latter month to rise abruptly in November and to fall as abruptly in December. The

CHART 1.

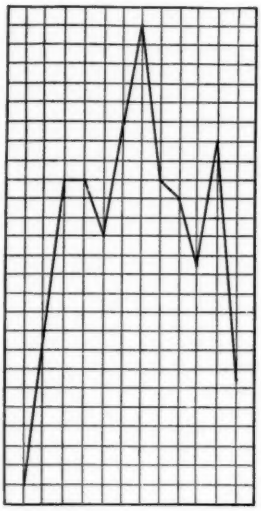


CHART 2.

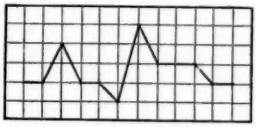


CHART 3.

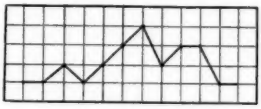


CHART 4.

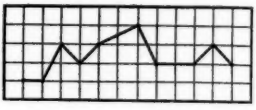


Chart 1. Relative frequency of occurrence by months in chronic diabetes; average from 55 cases.

Chart 2. Relative frequency of occurrence of glycosuria in case of S., under observation for seven years.

Chart 3. Relative frequency of occurrence of glycosuria in case of McK., under observation for four years.

Chart 4. Relative frequency of occurrence of glycosuria in case of J., under observation more than three years.

same facts can be stated in figures; the proportion of positive to negative observations in each month of the year is as follows:

January	1.4	to 6.6	July	6.1	to 9.0
February	2.8	" 4.2	August	4.6	" 2.4
March	4.6	" 2.4	September	4.4	" 2.6
April	4.6	" 2.4	October	3.7	" 3.3
May	4.0	" 3.0	November	5.0	" 2.0
June	5.2	" 1.8	December	2.5	" 4.5

It is interesting to compare with Chart 1, which is a composite of the averages of fifty five cases, charts made in the same way of a few individual cases. Charts 2, 3, and 4 illustrate the marked similarity in seasonal variations between the three cases that I have had longest under treatment and the general average of cases as shown in Chart 1. The case which Chart 2 represents has been under observation for seven years and has been seen during that time at least once a month, except on two occasions when he was absent from home for from two to three

months. Chart 2 represents a case that was under observation four years. There were six months in the middle of this period when he was not seen by me. The third case, represented by Chart 3, has been watched for three years, and during that time he has been seen at least once a month, except for two and one-half months in the third year. It will be observed that these charts correspond almost precisely with Chart 1; the increase in frequency of occurrence of sugar in the urine occurs in March or April, again most notably in July, and again, though to a less extent, in October or November. The periods of its least frequent occurrence are December, January, and May. It is interesting to note that the time of beginning of diabetes in those cases in which I could trace with probable accuracy its commencement corresponds to the periods of frequent occurrence as shown in Chart 5. It began in one-half the cases in July, in about one-fifth in April or November. The coinciding results of these statistics of individual chronic cases and of the average of fifty-five cases, and of the time of beginning of the disease in the twenty-four cases in which it could be accurately traced, are quite convincing of a seasonal variation in the severity of diabetes, at least in this locality. No hypothetical explanation of these facts that I have been able to devise is satisfactory to myself. During the last year and a half I have warned patients of the greater danger of exacerbation of their disease in March, April, July, and November, and of the need of greater dietary care at these times. The study of these fifty-five cases suggested that possibly similar results might be obtained from a study of the mortality tables of Chicago. The printed mortality reports afford the needed statistics from 1864 to 1893 inclusive. It may be interesting to note that the first recorded death from diabetes in Chicago was in January, 1864, and it was the only one that occurred in that year. Chart 5 shows the relative mortality by months during the twenty-nine years from 1864 to 1893. The same facts can be stated in figures. (Column 1, Table I.)

TABLE I.

Months.	Total mortality by months from 1864-93.	Mean temperature.	Mean barometric pressure.
January	51	24.0° F.	29.31
February	38	26.0	29.30
March	51	33.8	29.25
April	30	45.2	29.21
May	47	54.9	29.21
June	34	65.3	29.20
July	44	71.5	29.23
August	38	69.5	29.24
September	44	62.1	29.28
October	47	50.7	29.28
November	38	37.2	29.28
December	43	27.2	29.29

It will be observed at once that there is no similarity between Charts 1 and 5. In other words, that the study of recurring glycosuria in fifty-five cases does not correspond in its seasonal variations with the variations in mortality from the same disease. The mortality is higher about every other month, but averages a little higher during the winter months

CHART 5.

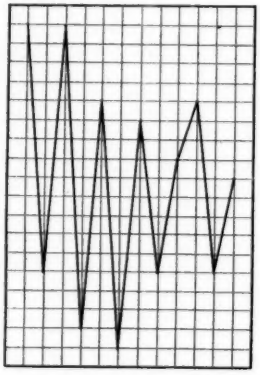


CHART 6.

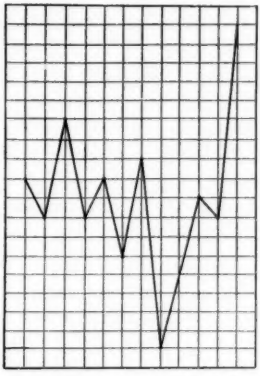
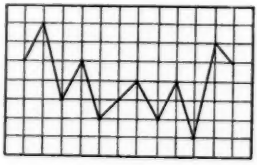


Chart 5. Relative frequency by months of deaths from diabetes during twenty-nine years in Chicago.

Chart 6. Relative frequency by months of deaths from diabetes during six years in Philadelphia.

than at other times, though this is the season when I observed glycosuria recurring least frequently in chronic cases. During these twenty-nine years 132 deaths occurred from diabetes in Chicago during the winter months, 128 during the spring months, 116 during the summer months, and 129 during the fall months. The least number of deaths from dia-

CHART 7.



Relative frequency by months of deaths from diabetes during eleven years in Cincinnati.

betes is seen to be in the summer months, when glycosuria seems to recur the oftenest. This fact in regard to the mortality of the disease is more marked if we place together the deaths from the disease in the four coldest and bleakest months of the year, namely, December, January, February, and March. For these months there were 183 deaths, for the

four following months 155, and for the next four 167. It may be interesting, also, to compare with Chart 5 Charts 6 and 7, made from less complete statistics of mortality in Philadelphia[1] and Cincinnati.[2] The same seasonal variations are observable in these as in the chart of Chicago's mortality. Indeed, the increased mortality in the winter months is still more noticeable. The marked difference between the frequency of deaths and the exacerbations of a chronic disease like diabetes illustrates well the fact that there need be no close relationship between the two, for in diabetes, as in many other chronic ailments, death many times results from intercurrent diseases rather than from the primary one. These figures and charts correspond in a general way to the conclusions drawn by Purdy from his most thorough and interesting study of the United States census statistics of diabetes. He concludes: "The territory which furnishes the lowest mean temperature and highest altitudes also furnishes the highest mortality from diabetes."[3] If the mortality is greatest in cold regions, we might expect that it would be greatest in any given region during the coldest months, and if altitude influences mortality the barometric pressure in a given locality might. But barometric pressure in one locality varies so triflingly as undoubtedly to be of no importance. This fact is more clearly shown by comparing the mean temperature of seasons during the twenty-nine years covered by Chicago's mortality table with the mortality from diabetes during those seasons.

	Mean temperature.	Deaths.	Mean barometric pressure.
Winter	26° F.	132	29 30
Spring	45°	128	29.22
Summer	69°	116	29.22
Autumn	50°	129	29.28

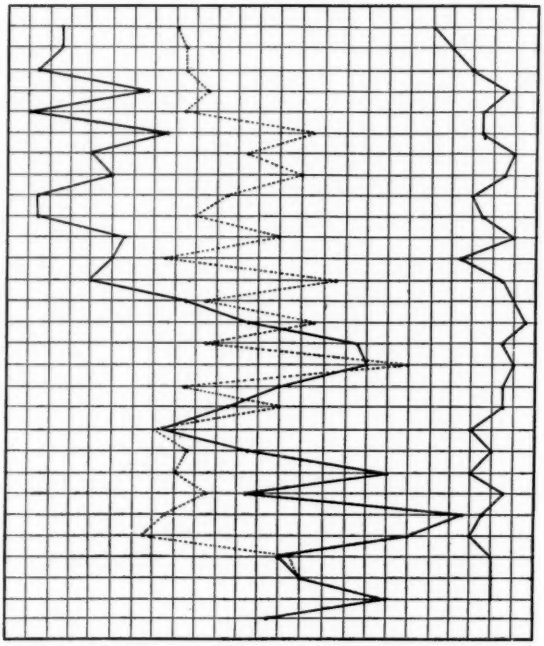
Although the variations in barometric pressure are at most only eight-hundredths of an inch, the highest pressure seems to correspond to the greatest death-rate.

It is probable that the mortality of diabetes is greatly influenced by the pulmonary complications which are a common cause of death in this affection, and therefore the mortality statistics do not correspond with the statistics of the recurrence of the disease or its variations in severity.

The following chart (8) and figures show the relative mortality of diabetes per 100,000 inhabitants in Chicago by years. It is especially interesting because of the demonstrable sudden and great increase in mortality that occurs after 1875.

[1] From statistics of six years. [2] From statistics of eleven years.
[3] Purdy: Diabetes. Students' and Physicians' Ready Reference Series.

CHART 8.



Relation of annual death-rate from diabetes (D) in Chicago to annual mean temperature (A) and mean midwinter temperature (W).

	Per 100,000 inhabitants.		Per 100,000 inhabitants.
In 1864 mortality was . . .	0.6	1879 mortality was . . .	3.5
1865 " " . . .	0.5	1880 " " . . .	3.6
1866 " " . . .	0.4	1881 " " . . .	2.8
1867 " " . . .	1.36	1882 " " . . .	2.3
1868 " " . . .	0.4	1883 " " . . .	1.7
1869 " " . . .	1.5	1884 " " . . .	2.5
1870 " " . . .	1.0	1885 " " . . .	4.2
1871 " " . . .	1.2	1886 " " . . .	2.5
1872 " " . . .	0.5	1887 " " . . .	4.5
1873 " " . . .	0.5	1888 " " . . .	4.0
1874 " " . . .	1.3	1889 " " . . .	2.8
1875 " " . . .	1.25	1890 " " . . .	3.0
1876 " " . . .	1.0	1891 " " . . .	3.8
1877 " " . . .	1.9	1892 " " . . .	2.9
1878 " " . . .	2.5		

From 1864 to 1875 the average mortality per 100,000 inhabitants is 0.92, and ranges from 0.5 to 1.5. From 1876 to 1892 the average is 2.8, and ranges from 1.7 to 4.5. The increases which this chart shows

do not correspond to increases in population, for between 1886 and 1888 the mortality from diabetes is greatest, and the gain in population was about one-seventh. From 1884 to 1886 was the next highest mortality, and the gain in population was about one-eighth. From 1890 to 1892 was the next highest, and the gain in population was one-sixth. From 1871 to 1873 the mortality was very low, but the gain in population was about one-seventh. From 1885 to 1886 occurred the greatest fall in the mortality, and the increase in population was about one-fifteenth. From 1879 to 1883 there was a steady and considerable fall in mortality, and a gain in population of more than one-third, or by years from 1879 to 1880 about one-sixteenth, from 1880 to 1882 about one-seventh, and 1882 to 1883 about one-sixteenth. Nor does the mortality correspond to the mean annual temperatures or the mean temperature of the coldest month, as the two upper lines in Chart 8 show. The uppermost one shows the variation in mean annual temperature during the various years; the broken line the mean temperature for January in each year. It will be observed that in 1872 and 1873, when the mortality is low, that the mean annual temperature is moderate and the mean winter temperature rather low. In 1866 and 1868 the mortality is also low, but in 1865 the mean annual temperature and the mean winter temperature are both low, but in 1868 the mean annual temperature is moderate, though the mean winter temperature is low. In 1883 the rate of mortality from diabetes is low, the mean annual temperature and the mean winter temperature are low; in 1886 the mortality is also low, the mean annual temperature is moderately high, and the mean winter temperature moderate. In 1889 the mortality is also low, but the mean annual temperature and the mean winter temperature are moderately high. In 1867 the mortality is relatively high for the first eleven years represented in this chart; the mean annual temperature is moderately high, and the mean winter temperature low. In 1869 the mortality is relatively high, the mean annual temperature moderate, the mean winter temperature high. In 1879 the mortality is great, the mean annual temperature moderately high, the mean winter temperature moderately low. In 1885 the mortality is high, the mean winter temperature is low, and the mean annual temperature moderately low. The same is true of 1887. Nor does the mortality rate vary synchronously with the mean annual barometric pressure. It is evident, therefore, that there is no relationship between mortality variations and variations in mean annual or winter temperature or barometric changes. The great increase in mortality from diabetes in Chicago after 1876 cannot be accounted for by either unusually rapid increase in population or variations of mean temperature. It would be interesting if statistics were accessible to compare the annual mortality with changes in density of population—that is, number of inhabitants per square mile.

The mean mortality in Chicago from 1864 to 1892 is 2.02 per 100,000 inhabitants. According to Davidson[1] and Hirsch,[2] in Australia it is about 2, in Scotland 1, in England about 5, in Ireland about 2. In other localities these authors base their statements of mortality upon the total number of deaths rather than upon the number of inhabitants. In Norway it is said to be 2.5 per 1000 of total mortality. In Germany 1. By the United States census for 1870, 1.7; for 1880, 1.9. In England 1.25, in Ireland 0.74, in Schleswig-Holstein, 0.65, Berlin 0.94, Chemnitz 1, Frankfort-on-Main 1.6, Wurzburg 1.2, Brussels 0.6. Purdy has shown that in different States in this country the mortality from diabetes per 1000 of total mortality varies from 0.55 in Alabama to 6.36 in Vermont.[3] In Illinois it is 2.11, in Iowa 2.42, in Indiana 2.72, Wisconsin 2.81, Michigan 2.68, Minnesota 1.99.

From a further study of the case records from which these statistics have been drawn several other interesting conclusions can be adduced, but they are not novel. For example, in mild cases variations in the amount of sugar in the urine in the same month are great, or it may be present or disappear and reappear several times in one month, though the patient maintains the same diet and treatment continuously. It is noticeable also that there is no relationship between the specific gravity of the urine and the percentage of sugar in it. For instance, taking figures from one case, with specific gravities of 1025 and 1028, there was a trace of sugar; with a specific gravity of 1029, none; with a specific gravity of 1030, 2 per cent.; with a specific gravity of 1035, 1 per cent.; a specific gravity of 1038, $1\frac{8}{10}$ per cent.; with a specific gravity of 1040, 1.8 per cent.; with a specific gravity of 1041, 1.5 per cent.; a specific gravity of 1043, 1.8 per cent.; a specific gravity of 1045, 1.5 per cent. In other cases a specific gravity of 1043 was accompanied by 2 per cent. of sugar; a specific gravity of 1048 by 1.5 per cent.; a specific gravity of 1038 by 2 per cent.; again, 1038 by 1 per cent., and 1030 by 2 per cent.; 1040 by 3 per cent., and 1028 by 3 per cent. The feelings of weakness and malaise, so characteristic of the diabetic state are correlated with the total amount of sugar eliminated, but very different quantities will produce similar effects in different individuals. For example, in one patient trifling weakness is noticed when 7.5 grammes are voided daily, and increases when 3.75 are voided, and is very marked when from 20 to 75 are voided daily. In another case moderate general discomfort of the characteristic kind is felt while from 7 to 10 grammes are voided, but becomes intense when from 40 to 120 are passed. In a third case equally intense symptoms accompany the passage of only 1.3 grammes daily, and are moderately severe when

[1] Davidson: Geographical Pathology.
[2] Hirsch: Handbook of Geographical and Historical Pathology.
[3] Purdy: Diabetes. Physicians' and Students' Ready Reference Series.

only 0.4 to 0.5 gramme is voided. These variations are readily understood if the fact is appreciated that an excess of sugar in the blood and urine is only one factor in the diabetic state, and that others little understood, which result from the malnutrition of the disease, are as important or perhaps more important causative factors of the general symptoms characteristic of the disease.

65 Randolph Street.

OBSERVATIONS ON THE DIAGNOSIS OF DIPHTHERIA.

A STUDY OF ITS LOCAL TREATMENT AND A FEW CASES TREATED WITH ANTITOXIN.

By Francis H. Williams, M.D.,
of Boston, Mass.

I shall assume that diphtheria is caused by the Klebs-Loeffler bacillus, and begins as a local disease. The diphtheria bacillus flourishes chiefly in the throat and is not a motile bacillus, but must be carried to the healthy individual. This is done principally by direct transferrence from mouth to mouth, or hand to mouth or nose. By mouth to mouth I mean, for example, a healthy child may catch diphtheria by biting from the same apple, putting the same toys in the mouth, using the same handkerchief as a child in whose throat diphtheria bacilli are present, or by kissing such a child; or a mother may use her own handkerchief for a neighbor's ailing child, and thus unwittingly carry the disease to her own children. The closer contact among children, and the habit they have of putting things in their mouths, show why the disease is more prevalent among them than among adults. The bacilli may get on to the hands of those who are taking care of or are about persons ill with diphtheria, and unless the hands are carefully washed may be transferred to the mouth at the next meal, on a piece of bread, for instance. Again, the bacilli may live for months in the garments of a person who has been ill with diphtheria. But I need not multiply examples as to the mode of contagion.

The bacilli, once conveyed to the mouth or nose, may remain some days, or more than a week even, without showing any sign of their presence, and in some cases may produce no symptoms of disease, although during this period such individuals may give diphtheria to others; but in the usual course of things the presence of bacilli in the throat is followed probably within a day or two by congestion, although this congestion may not be marked; and usually the tonsils, palate, or pharynx are first attacked; this congestion is sometimes accompanied by much œdema and swelling and is generally soon followed by the

appearance of false membrane which may at first cover a small area only, but following the spread of the congestion may appear in new areas on each day for a few days; in other words, the mucous membrane is, as it were, planted with bacilli and the false membrane results, but the crops may not all appear at once. Most of the bacilli are found in the outer layer of this false membrane. In a word, the natural history of the disease seems to be: bacilli on a moist alkaline surface, at a temperature favorable to their growth; irritation, congestion, false membrane. This membrane may disappear from the throat before the bacilli. Therefore in the beginning and at the close of the disease an individual is especially dangerous to the community, because in the first case his diseased condition is unsuspected or thought of slight consequence, and in the second case because the normal appearance of the throat, although the bacilli may still be present, leads to the belief that the danger of contagion from him is past. The bacterial test, therefore, is of special importance in these two stages of the disease, as it is the only means of detecting the diphtheria bacilli.

In 1892 I began to employ the bacterial test for my patients, and initiated its use at the Boston City Hospital. Since the beginning of 1893 this test has been carried out without interruption in the pathological laboratory of the hospital, under the direction of Professor W. T. Councilman, and it has now been applied to a large number of cases, among them to more than five hundred of my patients. A number of bacterial examinations have also been made for my patients in the laboratory of the Harvard Medical School.

As already stated, there are two stages of diphtheria in which this test is especially serviceable.

1. Very early in the disease before the throat shows any trace of false membrane.

2. Late in the disease after the false membrane has disappeared, that is, during convalescence.

Let me illustrate the *first class* of cases by giving the history of a household in which a case of diphtheria occurred. A patient of Dr. James J. Minot, a boy of eight years, had sore-throat with membrane on a certain Sunday; bacterial examination showed on Monday evening that the bacilli of diphtheria were present. Dr. Minot then put the patient under my care. The throats of the other members of the household presented no signs of diphtheria, but it seemed to me wise to follow my rule and have swabs taken from the throats of all. They were also taken by Dr. Minot from the throats of those outside of the household who had been much with the patient. In three of the members of the household bacilli of diphtheria were found, although, as already stated, there was nothing to indicate diphtheria to the unaided eye when the swabs were taken for diagnosis. One of these three throats was carefully

examined with the mirror by a laryngologist shortly after the swab was taken, and he found no sign of diphtheria. Thirty hours later there was no indication of membrane in two of these throats. Treatment with strong hydrogen-dioxide acid solution was begun on all these cases as soon as the Klebs-Loeffler bacilli were found, and in one of the adults the dioxide made conspicuous the false membrane on the right tonsil and anterior pillar, which was barely visible just before its application. No membrane was seen at any time in the throat of the second patient, a boy of two years. After three days' treatment with a strong hydrogen-dioxide solution the bacilli of diphtheria were not found in cultures from his throat. The third member of the household referred to above, the nursery maid of the first patient, had no sign of false membrane in her throat twenty-four hours after the swab was taken, but within a day or two it spread to nearly every part of the throat within sight, or which could be seen by depressing the tongue strongly. The diagnosis of diphtheria could not have been made in these cases, except by these bacterial examinations, at the stage of the disease when the swabs were taken. These four cases all recovered.

The advantages of early diagnosis, of early isolation, and early treatment are seen by contrasting the above-mentioned household with the following family:

In this family a child was taken ill with diphtheria, a few days later a second child, who died soon after at home; and at short intervals two other children, the mother, and aunt. Three children, the mother, and aunt came to the Boston City Hospital and were under my care. The children came too late to be helped, and all died. The mother and aunt were the last members of the family to show signs of the disease; they entered the hospital when they had been ill three and four days respectively, and recovered.

Such experiences show that as soon as a case of diphtheria is found in a household the bacterial test should be applied to all its members, though their throats may be normal in appearance. This would lessen the spread of the disease and give more patients the great advantage of early treatment.

In the *second class* of cases, that is, during what I may call convalescence, we frequently find that although the throat of a given patient looks perfectly well, yet it still contains bacilli, and isolation has, therefore, to be continued. The safeguard which bacterial examinations of the throats during the convalescent stage may be to the community is well illustrated by one of my patients (treated locally with corrosive sublimate, 1 to 10,000, and a ten volume solution of hydrogen-dioxide) from whose throat the false membrane had disappeared, and who had expressed a hope to be at home for the Thanksgiving festival. Formerly, discharge being determined by the inspection of the throat only, she would have

been allowed to leave the hospital much before the desired date. The bacterial test, however, which was made at short intervals for some weeks after the date of the festival referred to above, showed the bacilli to be present. One shudders to think of what might have followed her contact with the children of the family, and how, originating with her, the disease might have spread to other families.

In a former paper[1] I have referred to the persistence of the bacilli in the throat for some weeks, and in one patient (treated locally with corrosive sublimate, 1 to 10,000) for nearly three months, and pointed out the necessity of making a bacterial examination of the throats of patients before isolation is terminated.

We now come to another stage of the disease, in which there are acute appearances in the throat with false membrane. In these cases the Klebs-Loeffler bacilli are usually found. We may find cases, though they are uncommon, in which one, two, or even three cultures fail to show the bacilli of diphtheria,[2] although direct examination of the membrane itself sometimes shows them to be present; further, we may have cases in which no bacilli are found in the first cultures, but subsequent trials show them to be present; and finally we may have cases in which the bacterial examination during life fails to find them, although a post-mortem examination reveals them. On the other hand, it is quite possible to mistake some other bacillus for the bacillus of diphtheria. I therefore feel called upon to repeat my statement of last year (1893), that these examinations are not infallible; but when all precautions have been carefully taken, and more than one culture made, I believe that they may usually be relied upon, except in cases where the disease is laryngeal, and that we are certainly justified in taking a much more favorable view of the recovery of a patient in whose throat the bacilli are not found than in those where they are found, although the appearances in the throat may be similar in both. To make the bacterial test special facilities and training are necessary, and experience is required to estimate its clinical value in some cases, just as experience is required to interpret the import of a little albumin in the urine.

The diphtheria cases which give a pure or nearly pure culture of the bacillus seem to be very fatal unless efficient treatment is employed, so far as one may infer from forty-seven cases, in which the mortality was 64 per cent. A local treatment which I shall describe later is, I think, especially efficient in cases where the Klebs-Loeffler bacillus only is found; nine cases giving a pure or almost pure culture of the diphtheria bacillus in which this treatment was used early all recovered.

As regards cases with false membrane, in which the diphtheria bacilli

[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, November, 1893.

[2] Two swabs taken from the same patient at nearly the same hour, and examined independently at different laboratories, may give opposite results.

are not found: In fifty cases of what may be called pseudo-diphtheria, occurring in different years, there was a mortality of 28 per cent. As these cases were designated as pseudo-diphtheria on account of the absence from the bacterial test of the Klebs-Loeffler bacillus, we shall do well to look into this high mortality of 28 per cent., or fourteen out of fifty cases, a little more closely. These fourteen cases, in about an equal number of instances, contained either streptococci or staphylococci, or both together. 10 were laryngeal, with 7 intubations; 1 had typhoid fever; 1 scarlet fever; 1 septic, with nasal discharge; 1 had nasal discharge. Both the cases with nasal discharge were two years old and in wretched condition when they entered the hospital.

Excluding the case of typhoid fever, there are two features which most of these fourteen cases had in common, that is, their laryngeal character and their extreme youth; the average age was three years. It seems to me that these conditions determined the fatal outcome in these cases rather than any special coccus, or, what is more probable, if we take the ground that the laryngeal cases are usually diphtheria, the Klebs-Loeffler bacilli probably escaped detection in some of them. As autopsies were not obtained, this point could not be determined.

In studying diphtheria one is struck by the large number of cases in which the larynx is involved and the high mortality among such cases. As we continue to use the bacterial test and obtain more autopsies, I think we shall find that the percentage of fatal cases of membranous throat, where the bacillus of diphtheria is absent, will be smaller; large numbers of cases of so-called pseudo-diphtheria already reported by other observers in which the mortality is very low, point to this conclusion. If the bacterial test has been carefully made, no bacilli of diphtheria found, and the larynx and nose are not involved, the prognosis of cases of membranous throats where no other disease is present, such as typhoid fever, pneumonia, measles, or scarlet-fever, is usually good. Of such cases my experience thus far has justified me in taking a hopeful view. I recall a case seen in consultation where the physician in charge had given a wholly hopeless prognosis, but the bacterial examination and the general condition of the patient led me to take an opposite view, which proved to be the correct one.

The inferences which may be drawn from suspicious cases seem to be these: First, cases which come to the hospital looking like diphtheria usually are such—that is, perhaps about nine times out of ten. The milder cases of membranous throats are not sent to the hospital in such large numbers as the severer ones, and thus the proportion of cases of diphtheria is smaller in suspicious cases if seen outside of the hospital; this has been my experience in private practice. Second, cases which look like tonsillitis, for example, usually are such, although now and then among such cases the bacilli of diphtheria are found. In practice

it is well at first to regard cases which resemble diphtheria as diphtheria until careful bacterial tests have been made.

Before leaving the subject of diagnosis, allow me to remind you again of the importance of recognizing the mixed cases of diphtheria and scarlet fever; these are doubly dangerous, as they may give rise to either disease in other individuals, especially in a hospital for contagious diseases, and require special and careful isolation. In 1892, when I first saw these mixed cases, that is, found the Klebs-Loeffler bacillus *coincidently* with scarlet fever in certain patients, their presence was denied by most of those, at least in this country, who had given the question special study, but now their existence has, I think, been generally recognized.[1] Three cases of typhoid fever with membranous throats in which bacilli of diphtheria were found occurred during my service; one of these has already been referred to in a former paper of mine (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, November, 1893), and Dr. John L. Morse has described a second of these cases (Isabella N.) in the *Boston City Hospital Report* for 1894. In my above-mentioned paper I also referred to the coincidence of diphtheria and measles during my service.

It is not very rare to see patients with syphilis presenting appearances in the throat similar to those found in diphtheria (of course, both diseases may occur together). If syphilitic patches occur with an acute tonsillitis or pharyngitis, the similarity to diphtheria is more striking.

Let us now consider the local treatment of diphtheria first from the laboratory, and, second, from the clinical side.

The micro-organisms dangerous above all others in the throat are the venomous bacilli of diphtheria, and an early attack upon them with a suitable application diminishes the amount of the poison and probably prevents the extension of the bacilli to less accessible parts.

A rational step to be taken in our endeavor to destroy these micro-organisms is to ascertain what germicides will find and kill them quickly, and also which of the germicides sometimes used will not do so. I say find and kill, as there are many germicides which will kill the bacilli in the laboratory, but when used in the throat simply wash the surface of the false membrane. In the plan which I adopted in the study of the action of various germicides upon the Klebs-Loeffler bacillus and several of the organisms which sometimes accompany it, I assumed that

[1] In scarlet fever it seems to me desirable to prevent the dissemination of the epithelial scales which are often shed abundantly, and to hasten the removal of this layer of epithelium in order to free the normal skin. For this purpose I have the patients rubbed all over daily—avoiding the hair—with a mixture containing seven parts of 10-volume hydrogen dioxide solution and one part of glycerin; if the patient finds this too sticky, the proportion of glycerin may be reduced. A quarter of the body may be done at a time, and some hours later another quarter, and so on. As soon as any portion of the skin is normal the application may be there dispensed with.

the germicide to be efficient must act quickly, as the contact in the throat between the germicide and the organisms is limited to a few seconds. It was, therefore, necessary to ascertain what would kill these organisms in five or ten seconds.

Second, if an agent or agents could be found to kill the organisms in five or ten seconds, the next step would be to ascertain what harmful effect, if any, they would have upon man, and to select one or more of those which could be least injurious to him; many germicides, such as corrosive sublimate, carbolic acid, the cresols, hydrochloric, nitric, phosphoric, and sulphuric acids alone and in efficient strengths are either poisonous or irritating, or both.

The third step in the investigation would be to learn how to apply efficiently a substance quickly fatal to the organisms and harmless to man, provided such a substance could be found.

Tests with various germicides were made under my direction, or by me, in the Biological Laboratory of the Massachusetts Institute of Technology upon the bacillus of diphtheria, the staphylococcus pyogenes aureus and albus, the streptococcus pyogenes and a diplococcus, and I wish to express here my appreciation of Prof. W. T. Sedgwick's kindness in permitting me to use his laboratory and my obligations to his former and present assistants, Messrs. McLauthlin, Mathews, and Keith, for carrying out many of these tests.[1]

[1] The following outline of a test taken from a former article will show the method pursued. In any of the ordinary methods for determination of the germicidal action of any liquid disinfectant upon a given bacterial species three distinct and successive processes may usually be recognized. These are: first, the mingling for a known period of a pure culture of the given species with a suitable amount of the germicide; second, the dilution, after the desired interval has elapsed, of this mixture to the extent necessary not only to check further bactericidal action, but also to avoid the possibility of any future inhibitory effect; and third, the planting of a portion of this dilution in a suitable culture-medium, in order to permit the growth and consequent recognition of any bacteria which may have survived the action of the germicide.

As a source of the diphtheria bacillus, we used a pure culture that came originally from the laboratory of Dr. Welch, of Johns Hopkins University, or one from Dr. Prudden's laboratory, in New York, or from my own cases. From these plantings were made in bouillon, and to insure greater accuracy, in most of the experiments old and fresh bouillon cultures were used side by side, or a mixture of the two was employed.

The following record of a single action experiment with its control will serve to illustrate this method:

Five c.cm. of 50-volume dioxide solution (⅙ per cent. acid) were placed in a 60 c.cm. Erlenmeyer flask and 0.25 c.cm. added of a bouillon culture of the diphtheria bacillus. (In later tests the germicide was poured over the culture.) Ten seconds after, in order to stop the action of the dioxide, the mixture was quickly poured into a litre flask containing 600 c.cm. of slightly alkaline normal salt solution. Thirty seconds after this, the whole having been well shaken, 0.2 c.cm. was transferred to 75 c.cm. of alkaline normal salt solution in another flask. At the end of three minutes (in the latter experiments at the end of thirty seconds) 1 c.cm. of the last dilution was planted in 6 c.cm. of bouillon. At the end of four and a half minutes 1 c.cm. of the dilution was added to 6 c.cm. of melted glycerin agar at 40° C. and the mixture at once poured into a Petri dish.

In the control experiment 0.25 c.cm. of the bouillon culture of the bacillus was mixed with 600 c.cm. of alkaline normal salt solution, *then* 5 c.cm. of 50-volume dioxide solution (⅙ per cent. acid) added, and all well shaken. Thirty seconds after the addition of the dioxide 0.2 c.cm. of

All of the tests given in the following tables, besides many others, have been made in duplicate, and some have been repeated several times.

TABLE I.—TESTS WITH VARIOUS GERMICIDES UPON THE KLEBS-LOEFFLER BACILLUS.

Action period, 10 seconds.

Germicide.	Did not kill all.	Killed all.
Hydrochloric acid[1]	3 per cent.	4 per cent.
Nitric acid[1]	.....	2 "
Sulphuric acid[1]	5 per cent.	10 "
Phosphoric acid[2]	2 "	
Boric acid	4 "	
Solution of chlorinated soda (hypochlorite of sodium) containing of available chlorine	1/2500	1/1000
Chlorine[2]	1/25,000	1/10,000
Corrosive sublimate	1/10,000 0.01 per cent.	1/5000 0.02 per cent.
Chloroform in water	1/200	
Carbolic acid[3]	5 per cent.	5 per cent.
Tricresol in 25 per cent. alcohol	.....	3 "
Metacresol in water[4]	.....	½ "
Paracresol in water	.....	½ "

TABLE II.—TESTS WITH VARIOUS GERMICIDES UPON THE STAPHYLOCOCUS PYOGENES AUREUS.

Action period, 10 seconds.

Germicide.	Did not kill all.	Killed all.
Hydrochloric acid	2 per cent.	4 per cent.
Nitric acid	½ "	2 "
Solution of chlorinated soda (hypochlorite of sodium) containing of available chlorine	1/2500	1/1000

the mixture was transferred to 75 c.cm. of alkaline normal salt solution in another flask. After four and a half minutes a glycerin-agar plate was made as before.

After a few days' growth in the incubator, the agar plate from the control experiment showed 1660 colonies of the diphtheria bacillus. At the same time, neither the agar plate nor the bouillon tube prepared from the action experiment showed any growth.

Evidently the agar plate is of especial advantage when a part only of the bacteria are killed —*i. e.*, when the germicide is diluted just beyond its effective limit. The bouillon tube gives no precise means of distinguishing between the survival of a part and the survival of the whole of the bacteria.

[1] U. S. Pharmacopœia dilute acid contains 10 per cent. of acid.

[2] Chlorine-water contains 0.4 per cent. of chlorine, and this diluted with 99 parts of water gives 1/2500. Chlorine-water cannot be mixed with hydrogen dioxide solutions.

[3] Five per cent. carbolic acid did not always kill.

[4] I have used a solution containing ½ per cent. of metacresol and a 25-volume hydrogen dioxide acid solution in twenty-five cases of diphtheria. Objection has been made by some patients to the taste, and it seems to me to be less satisfactory than a strong hydrogen dioxide acid solution alone.

Germicide.	Did not kill all.	Killed all.
Corrosive sublimate	1/1000	
Carbolic acid	1 per cent.	2½ per cent.
Tricresol in water	1 "	1 "
Metacresol in water	¼ "	½ "
Paracresol in water	½ "	½ "
Orthocresol in water	½ "	

STAPHYLOCOCCUS PYOGENES ALBUS.

Germicide.	Did not kill all.	Killed all.
Hydrochloric acid	2 per cent.	4 per cent.

TABLE III.—TESTS WITH VARIOUS GERMICIDES UPON THE STREPTOCOCCUS PYOGENES.

Action period, 10 seconds.

Germicide.	Did not kill all.	Killed all.
Hydrochloric acid[1]	⅛ per cent.	½ per cent.
Nitric acid	.....	½ "
Solution of chlorinated soda (hypochlorite of sodium) containing of available chlorine	1/2500	1/1000
Corrosive sublimate	1/10,000	1/5000
Carbolic acid	1 per cent.	5 per cent.
Metacresol in water	¼ "	½ "
Paracresol in water	¼ "	

From these tables it will be seen that, with the exception, perhaps, of solution of chlorinated soda (hypochlorite of sodium) and the cresols, there is no one germicide that is equally active against all of these organisms. In general, it may be said that the streptococcus pyogenes is the easiest to kill, the staphylococcus pyogenes aureus the most difficult. A few tests made upon the staphylococcus pyogenes albus indicate that in this respect it is similar to the aureus. A weak solution of hydrochloric acid, ½ per cent., will kill the streptococcus in ten seconds, but it takes a 4 per cent. solution to kill the Klebs-Loeffler bacillus in the same time. It takes about the same strength to kill the staphylococcus aureus and albus. The staphylococcus aureus is more resistant to corrosive sublimate than these other organisms; on the other hand, it is more susceptible to carbolic acid than they are.

It should be remembered that in the laboratory tests the microorganisms are presented to the germicides in a liquid culture and are easily reached, whereas, clinically, they are found enveloped in a mass of pus or false membrane or other matter; hence the advantage of using the substance I am about to consider.

[1] Two tests were made with ¼ per cent. hydrochloric acid; in one all were killed, in the other nearly all—that is, the bouillon was clear, but two colonies grew on the agar plate; on the control-plate there were 100 colonies.

To discuss the action of all the germicides I have studied during my work on diphtheria would not be feasible here, but I will devote a few words to one of them, namely, hydrogen dioxide.

The general principle in antiseptics which my studies have brought out, and which I believe to be a new one, is the advantage of mixing the stronger germicides with hydrogen dioxide, a substance which has the special property of disintegrating some kinds of dead organic matter, such as pus or certain portions of false membranes, thus rendering the bacilli more accessible, and so opening the way for the action of the stronger germicides. Pure hydrogen dioxide solutions, or rather neutral solutions, are comparatively weak germicides, but we may put with them any compatible germicides or use them alternately with an incompatible one, the choice depending upon the micro organisms we desire to kill. For instance, the mineral acids which are found in all the 10-volume hydrogen dioxide solutions sold in the market increase the germicidal value of these solutions. A 20-volume, or even a 40 volume, neutral solution of hydrogen dioxide will not kill all the streptococci in ten seconds, but a weak solution of hydrochloric or nitric acid will do so. Tests, therefore, of the germicidal value of the hydrogen dioxide solutions should always take into account the kinds and amount of free acid present.

TABLE IV.—TESTS WITH HYDROGEN DIOXIDE NEUTRAL AND ACID SOLUTIONS UPON THE KLEBS-LOEFFLER BACILLUS.

Action period, 10 *minutes*.

2½ volume containing 0.05 per cent. acid[1] did not kill all.

This is stronger in acid than a U. S. Pharmacopœia 10-volume hydrogen dioxide solution diluted with three parts of water, a strength which is frequently used by physicians.

Action period, 10 seconds.

Did not kill all.

5	volumes	containing	.	.	.	.	0.1	per cent.	acid.
10[2]	"	"	.	.	.	.	0.2	"	"
12½	"	"	.	.	.	.	0.25	"	"
25[3]	"	"	.	.	.	.	0.5	"	"

50 volumes neutral or slightly alkaline.

Action period, 5 seconds.

Killed all.

50	volumes	containing	.	.	.	.	0.17	per cent.	acid.
100	"	"	about	.	.	.	0.3	"	"
150	"	"	.	.	.	.	0.45	"	"
200	"	"	.	.	.	.	0.6	"	"
250	"	"	.	.	.	.	0.9	"	"

[1] The acid was estimated as HCl with a $^1/_{100}$ normal NaOH solution and phenol phthaleïn.

[2] The U. S. Pharmacopœia solution contains not more than 0.036 per cent. of acid.

[3] Sometimes a 25-volume solution containing ⅛ per cent. acid will kill and sometimes it will not kill all.

TABLE V.—TESTS WITH HYDROGEN DIOXIDE NEUTRAL AND ACID SOLUTIONS UPON THE STAPHYLOCOCCUS PYOGENES AUREUS.

Action period, 10 seconds.

Did not kill all.

25 volumes containing	. . . . .	0.5 per cent. acid.
50 " "	. . . . .	1.1 " "
80 " "	. . . . .	0.26 " "

Action period, 5 seconds.

Killed all.

100 volumes containing	. . . . .	1 per cent. acid.
110 volumes neutral		

Staphylococcus pyogenes albus was also killed by a 100-volume hydrogen dioxide solution containing 1 per cent. acid.

TABLE VI.—TESTS WITH HYDROGEN DIOXIDE NEUTRAL AND ACID SOLUTIONS UPON THE STREPTOCOCCUS PYOGENES.

Action period, 10 seconds.

Did not kill all.

10 volumes containing	. . . .	0.05 per cent. acid.
10 " "	. . . .	0.10 " "
20 volumes neutral or slightly alkaline.		
40 " " " " "		

Killed all.

12½ volumes containing	. . . .	0.25 per cent. acid.
50 " "	. . . .	0.2 " "

Tests with hydrogen dioxide acid solutions upon a diplococcus from the throat of a patient ill with diphtheria showed that a 25-volume solution containing 0.1 per cent. of acid did not kill in ten seconds, but that a 50-volume solution containing 0.1 per cent. of acid did kill in ten seconds.

It is not assumed that these bacterial tests have the accuracy of chemical ones. I have found, nothing, however, which vitiates the general character of the deductions drawn from them: for example, first, that neutral hydrogen dioxide solutions are comparatively weak germicides; second, that the mineral acids, especially nitric acid, are stronger germicides; third, that hydrogen dioxide and hydrochloric acid together are more efficient than either alone against the Klebs-Loeffler bacillus; and fourth, that the 50-volume (0.2 per cent.) acid hydrogen dioxide is not a good germicide against the staphylococcus. (100-volume hydrogen-dioxide acid (1 per cent.) solutions are required to kill this organism in five seconds.)

I hope to discuss the more general application of tests given in this paper in another article.

I observed an interesting correspondence between the laboratory tests and clinical experience in several cases, and will recur to this point.

(To be concluded.)

THE MODERN ASPECT OF INDICANURIA,

WITH SPECIAL REFERENCE TO THE RELATION BETWEEN INDICAN AND THE ACIDITY OF THE GASTRIC JUICE.

By Charles E. Simon, B.A., M.D.,
of Baltimore.

The earliest announcement of the discovery of indigo in an animal excretion was made by Prout (*Nature and Treatment of Stomach and Urinary Affections*, third edition, London, 1840, p. 96; see also fifth edition, 1848, p. 567) in 1840.

Urines colored blue to a greater or less extent, as well as blue sediments, it is true, had been described long before Prout's days, but the nature of the coloring had not been definitely established.

The earlier literature from the times of Hippocrates and Galenus has been compiled by Martin (Heller's *Archiv*, 1846, p. 191).

Actuarius ("De Urinis," quoted by Willis, *Urinary Diseases*, p. 139) toward the end of the 13th century records an instance of slate-colored urine under the name of "Urina Veneta," and Janus Planeus (*Ibid.*, p. 131) in 1767 describes under the same title the urine of a man of sixty which deposited on standing a deep ultramarine blue sediment.

The first definite attempt at analysis of such blue coloring-matter was made by Julia Fontanelle (*Arch. Gén. de Méd.*, 1823) in 1821, the results being published in 1823. The patient, affected with an acute disease of the "urinary tract, aged eighty-two years, passed urine on the second day of the disease which was of a marked blue color, and deposited a filamentous sediment of the same color on standing.

The results of his analysis Fontanelle states as follows: The urine contained but little urea, much albumin, what he calls "gelatine," probably meaning mucus, and hydrocyanate of iron united to sodium as a triple salt, to which he refers the blue color of the urine. He admits, however that the amount of urine at his disposal was not sufficient for the purpose of a complete analysis.

Braconnot (*Journ. de Chim. Méd. de Pharm. et de Toxicol.*, 1845, vol. i. p. 569; see also *Annal. de Chim. et de Physique*, 2d series, vol. xxix. p. 252), in 1845, states that twenty years ago he had occasion to examine a urine in which a fine blue substance, looking like Prussian-blue, was suspended. This pigment he called cyanourine. In the same article Braconnot also describes a green urine, and attempts to prove the identity of the coloring-matter in this case with his cyanourine, imagining the green color to result from a mixture of the yellow color of normal urine with a small amount of the blue cyanourine.

Spangenberg (Schweigger's *Journal*, vol. xlvii. p. 487), Garnier, and Delens (*Ibid.*, vol. xxiii. p. 262; see also *Journal de Méd.*, vol. lxxii. p.

174) describe a similar pigment, which Simon (Simon's *Beiträge zur Physiol. und Pathol. Chemie und Microscopie*, Berlin, 1843, vol. i. p. 118), however, wishes to be distinguished from Braconnot's and each other.

Julia Fontanelle (*Journal de Chimie Méd.*, 1845, vol. i. p. 341) in 1845 first found Prussian-blue, or the sesqui-ferrocyanide of iron in the urine of a boy laboring under severe colic, attributed to his having swallowed a quantity of ink. The blue deposit continued for a day or two after the attack, leaving the urine a natural color, but containing some soluble cyanide, as a blue precipitate was produced upon the addition of an iron salt. Several other instances of Prussian-blue deposits have occurred, and it is remarkable that in most of these iron has been accidentally or intentionally taken. These deposits are said to be artificially produced by giving to a patient who has been taking some preparation of iron a few doses of ferrocyanide of potassium.

In the same year Velsen (*Prager Vierteljahrsch.*, vol. v. p. 109) mentions the occurrence of a dark violet urine which he observed in a man aged eighty-four years, suffering with chronic cystitis, following or associated with the taking of milk and lime-water. Unfortunately a chemical examination was not made.

In 1840 then, Prout (*loc. cit.*; see also Dr. O. Rees on the *Analysis of Blood and Urine*, London, p. 81) for the first time demonstrated the occasional occurrence of indigo in the urine. His patient was a middle-aged person of a neurotic temperament. He was in the habit of taking Seidlitz powders, and the indigo most generally appeared in the urine in the form of a dark-blue sediment, after he had taken one of these powders. On one occasion the quantity was so large that it could be collected and examined, when it was found to possess all the properties of indigo, and was obtained in a state of purity by sublimation. Prout says that he expected the blue pigment to consist of Prussian-blue.

In 1845 Heller (Heller's *Archiv für Physiol. und Pathol. Chemi. und Microscop.*, 1845, p. 161; *Ibid.*, 1844, p. 14, and 1846, pp. 19, 536, and 539) found a substance in the urine of cholera patients, and later also in normal urines, which he termed uroxanthine, and which can be broken down into a blue and a red pigment, termed uroglaucine and urrhodine respectively, both of a crystalline nature.

Martin (Heller's *Archiv*, 1846, p. 191) in 1846 further describes a blue pigment, urocyanine, in the urine in various diseases, associated with what he terms "a deficient decarbonization of the blood."

Scherer (*Annal. d. Chemie und Pharmacie*, 1846, vol. lvii. p. 180) in the same year expressed the opinion that the blue color obtained by boiling urine with muriatic acid is referable to a decomposition-product of the normal urinary pigment.

In 1847 Virchow next mentions a blue urine which he himself had observed in the case of a weakly boy, suffering with vesical pains and

incontinence. Freshly voided, the urine was very pale and slightly yellow, and only deposited small blue flocculi when exposed to the air. These flocculi, microscopically examined, consisted of indigo-blue, radiant needles, which underwent no change upon micro-chemical treatment. This pigment he termed "Harnblau."

Later, in 1854, Virchow (*Arch. für Path. Anat.*, 1847, vol. i. p. 423, and vol. vi. p. 259; see also Würzburg, *Verhandl.*, vol. ii. p. 303) states that he has met with the same substance on treating the urine of an almost famished man with mineral acids.

In 1855 Hill Hassall (*Philosoph. Magaz.*, September, 1853, referred to in *Prager Viertelj. f. d. prakt. Heilk.*, 1855, vol. xlvi., *Analekten*, p. 73) describes a urine which he observed in 1852, in which, after standing for three or four days, a film had formed upon the surface, which at first presented a slate color, but later turned into a deep blue. Microscopically, this film was seen to consist of the usual "vibrios," triple-phosphate crystals, and a large number of dark or light grayish particles. Gradually this blue pigment disappeared from the urine. The extracted coloring-matter presented all the characteristics of indigo. Hassall later on repeatedly observed the same pigment in urines, obtaining the same at times in the form of a voluminous precipitate, at others in quantities only recognizable by the microscope. He imagines the indigo in the urine to result from the oxidation of a brown pigment which he observed in the same urine, and which he regarded as a derivative of hæmatine. The urines from which the indigo was obtained were mostly of a light straw color, alkaline in reaction, of a low specific gravity, and readily became turbid; none of the cases, however, were cases of Bright's disease. Its occurrence Hassall regards as pathological.

V. Sicherer (*Annal. d. Chem. und Pharm.*, 1854, vol. xc. p. 1) obtained indigo-blue from an apparently normal urine on boiling with a mineral acid. The identity of indigo-blue with the coloring-matter described as cyanourine, Sicherer thinks cannot be definitely excluded.

Virchow (*Arch. f. Path. Anat.*, vol. vi., *loc. cit.*) also expresses the view that the "Harnblau" probably never exists preformed in the urine, but that it appears after exposure to the air, in consequence of the decomposition of its mother-substance, or upon boiling with mineral acids, preferably muriatic acid, when gradually, on standing, a violet, brownish, or black sediment appears, which may or may not be crystalline. Virchow in short appears to imagine a direct relation to exist between his "Harnblau" and the blood pigment.

In 1854 Gubler observed the blue color resulting from the addition of nitric acid to albuminous urine, and thought the pigment formed to be a derivative of indigo. He found this pigment in cases of cholera, typhoid fever, smallpox, scarlatina, acute albuminuria, and especially abundant in choleriform diarrhœa and cholera Asiatica, and also taught

that prognostic conclusions could be drawn from the intensity of the reaction. (See Schmidt's *Jahresb.*, 1859.)

Thus stood matters in 1857, when Schunck (*Mem. of Lit. and Phil. Soc. of Manchester*, vol. xiv. p. 239; *Phil. Mag. and Journal of Sc.*, 4th series, vol. xiv. p. 288. See also *Chem. Cbl.*, 1857, p. 957, and *Jahresb. d. Chem.*, 1855, p. 659; 1857, p. 564; 1858, p. 465) demonstrated the constant presence of a substance in the urine which yields indigo-blue on boiling with mineral acids or when undergoing a certain decomposition upon exposure to the air. This substance he called indican, and thought the same to be identical with vegetable indican, obtained from certain plants, such as the indigofera tinctoria, isatis tinctoria, etc.

Since that time blue urines and blue sediments have been repeatedly observed.

Wyss (*Arch. f. Heilkunde*, 1863, vol. ix. p. 235) thus describes the occurrence of a dark brownish-violet color in urine voided immediately after an attack of cholera, after having stood exposed to the air until ammoniacal decomposition had set in. The same result was obtained on boiling such urines with mineral acids, which fact had been already demonstrated for almost any urine to a greater or less extent by Heller in 1844, as set forth above, and by Middledorpf (Günzburg's *Ztschf. f. klin. Med.*, 1852, p. 65) in 1849.

Frerichs (*Die Bright's che Nierenkrankheit*, 1851, p. 191), Begghby (*Monthly Journal*, October, 1852, cit. by Güterbock in *Der Deutsch. Klinik*, 1852), Güterbock (*Deutsch. Klinik*, 1853), Buhl (*Ztsch. f. rationelle Med.*, N. F., 1855, vol. vi. p. 1), Gubler (*Gaz. Méd. de Paris*, December, 1854), Lindsay and Osborne (*Medical Times and Gazette*, March, 1855, cited by Thudichum, *Ninth Report of the Medical Officer of the Privy Council*, 1866, London, 1867, p. 468), Thudichum (*l. c.*), and Lehman ("Chem. und physik. Studien über die Cholera," Dissertation, Zürich, 1857) had made the same observations in choleraic urines.

Brudeberger (Virchow's *Archiv*, vol. xxxviii. p. 310) claimed to have demonstrated the presence of biliary coloring-matter in cholera urine, by treating the same with nitric acid, a fact which was doubted, however, by Buhl (*l. c.*) and Frerichs (*l. c.*); and Gubler (*Gaz. des Hôp.*, 1866, No. 104, p. 410) expresses the opinion directly that the color-play referred to must be referable to indigo. Thudichum (*l. c.*) finds that on boiling cholera urine with mineral acids a certain substance is split up into a blue and a red pigment, choleraic urorubine, and choleraic urocyanine, calling the mother-substance choleraic urocyaninogen. In other words, Thudichum here expresses under different names a fact which had already been established by Heller twenty-two years before, and, like Heller, he did not recognize the identity of his choleraic urocyanine (Heller's uroglaucin) with indigo. Wyss (*l. c.*) also demonstrated the incorrectness of Brudeberger's observations, and succeeded

in definitely demonstrating the true nature of the blue coloring-matter obtained from cholera urine, recognizing this to be indigo, derived from the indican of Schunck.

While Wyss had thus established the identity of Thudichum's choleraic urocyaninogen with indican, and that of choleraic urocyanine with indigo, Kletzinsky (*Wiener med. Woch.*, 1859, No. 27, cited by Thudichum in his *Pathology of Urine*, p. 326) had done the same with Heller's uroglaucin, also proving the identity of Heller's urrhodine with the indigo red of Berzelius, and Schunk that of Heller's uroxanthine with indican.

In 1858 and 1859 Carter (*Edinburgh Med. Journal*, July, 1858, p. 86, vol. iv., part 1, and 1859, vol. v. p. 119) succeeded in establishing the constant presence of indican in health as well as in disease, having examined the urines of 300 persons in this direction.

He fully coincides with Heller in regarding indican as a physiological and constant constituent of human urine.

The reason why Hassall regarded indican as a pathological constituent of the urine, Carter refers to the putrefactive method employed by the former.

Schunck established the presence of indican in 39 out of 40 normal urines.

From this period on the occurrence of blue urines and blue sediments need not occupy our attention any longer, and it will suffice to append here a short *résumé* of the literature upon the subject up to date.

Gilchrist (*Edinburgh Med. Journal*, 1862; see also *Allgem. Med. Central Ztg.*, 1862, and *Prager Viertelj. f. d. prakt. Heilk.*, 1863, vol. lxxvii., *Analekt*, p. 14) in 1862 cites the case of a woman, aged fifty-eight years, suffering with rheumatism for many years; her urine was of a dark greenish-yellow color, ammoniacal, and deposited a bluish-green sediment consisting of triple phosphates, epithelial cells, and amorphous yellowish-brown, and light and dark blue particles. This pigment Gilchrist regards as indigo-blue. He also refers to a case of indigosuria recorded by Beale.

Beneke (*Pathol. d. Stoffwechsels*, Berlin, 1874, p. 185) in 1874 mentions a blue urine that was passed by a case of chronic Bright's disease associated with general anasarca, the blue color however only appearing on certain days.

Beneke also refers to one case of indigosuria in which the blue coloring-matter was recognized as indigo by Debuque (cited by S. Parkes: *The Composition of the Urine*, London, 1860, p. 197).

A very interesting case was reported in 1888 by Kahler (*Prager med. Woch.*, 1888, p. 543), who observed in the urine of a patient, aged seventy-six years, the subject of a unilateral pyonephrosis (pyelitis) of many years' standing, the formation of a bluish-red film on the surface, with a

sediment that was full of blue coloring-matter, the walls of the vessel being likewise covered with the same. The urine was ammoniacal, and emitted a mild odor of sulphuretted hydrogen. The blue coloring-matter in the sediment occurred in both amorphous and crystalline form, and was recognized as indigo. The indigosuria in this case always appeared paroxysmally, and was accompanied by hydrothionuria. That hydrothionuria is the result of bacterial activity was shown by Müller (*Berliner klin. Woch.*, 1887, Nos. 23 and 24), and the simultaneous occurrence of indigo and sulphuretted hydrogen would make it appear very probable that the former arises under the same or similar conditions as the latter, a supposition which is very strongly supported by the observations of Alvarez (*Comptes rend. d. l'Académie des Sciences*, 1887, vol. cv. p. 286). The indican in this case was never found to be increased, but rather diminished, in quantity.

A similar case was observed by V. Udránszky and published by Plosz (*Zeitsch. f. physiol. Chemie*, vol. vi. p. 504, and vol. viii. p. 86), in which the urine was ammoniacal, and contained free indigo and sulphuretted hydrogen, the case being one of ulcerative cystitis with pyelitis and nephritis. A red pigment was also noticed in crystalline form, the chromogen of which is frequently associated with indican in normal and pathological urines. In Kahler's case there were no red crystals observed, but a red pigment could be extracted, which Kahler thinks identical with that obtained by Udránszky and Plosz.

In 1880 Litten (*Central. f. d. Med. Wiss.*, 1880, p. 823) reported a case of infiltrating carcinoma of the liver with simple round ulcers of the stomach, in which death resulted from gastro-intestinal hemorrhage. The urine at first was icteric, but later became a dark blue violet, without doubt referable to indican.

Ultzmann ("Neuropathien des männlicken Harn und Geschlechtsapparates;" *Wiener Klinik*, 1879, p. 120. "Harnconcretionen des Menschen und die Ursachen ihrer Entstehung." Wien, 1882) observed a violet-colored urine with markedly blue sediments in a fatal case of peritonitis; he furthermore mentions the case of a tabetic with vesical paresis, in which blue sediments were seen for a long time and suddenly disappeared; the same patient suffered with temporary glycosuria without other diabetic symptoms. The same observer also states that urates, especially the ammonium urate, are very apt to carry down indigo and appear blue or violet colored, and that indigo is not infrequently found in traces, at least, in urinary calculi. Concretions containing a larger amount of indigo, however, and which might properly be called indigo calculi, are of decided rarity. In the literature, as far as I have been able to find, only two cases of indigo calculi have been reported. Ord (*Trans. Path. Soc. of London*, 1878, vol. xxix. p, 155) thus records an instance in which a stone obtained from the pelvis of the right kidney

weighed 2.6 grammes, consisting of coagulated blood, and phosphates, but to the greatest extent of indigo. The left kidney in this case was the seat of a round-celled sarcoma which also occluded the left ureter, producing dilatation of the pelvis and calices, which were filled with pus and a branching phosphatic calculus.

The second case of this kind was reported by Chiari (*Prager med. Woch.*, 1888, p. 541), where concretions were discovered in both kidneys, consisting to a large extent of indigo, with an albuminous basis and a small amount of phosphates. The patient, a female of thirty-four years, had had attacks of renal colic for five years off and on, and in the urine pus and smaller concretions had been repeatedly observed.

Ord (*l. c.*) explained his case by assuming that the formation of pus in the left kidney and the retention of decomposing pus constituted the source of increased indol-formation, resulting in an increased elimination of indican by the right kidney, where, coming into contact with the acid urine in the healthy right kidney-pelvis, indigo would be set free, leading to the formation of a stone.

Chiari also looked upon the bilateral suppurative pyelitis as the *primum mobile*, but regards the setting free of indigo as the result of microbic activity upon the indican.

A blue urine was further reported by A. Robin (*Compt. rend. de la soc. de Biol.*, 1875) in 1875, coming from a case of hysteria. The blue pigment in this case Robin, upon chemical examination, regards as identical with Braconnet's cyanourine, and definitely denies its identity with indigo.

V. Jaksch (*Diagnostik*) states that indigo was found to be present in remarkable abundance during the process of ammoniacal fermentation in the urine of jaundice, from a patient with hypertrophic cirrhosis of the liver. Numerous indigo-crystals, of which v. Jaksch gives an excellent representation, were also found by him in a case of hepatic abscess, in the sediment of the urine.

I myself have not infrequently observed the presence of indigo in the urine, often coloring epithelial cells and leucocytes, in cases of chronic interstitial nephritis, while in decomposing urines traces at least can be found in almost every specimen. It has thus been seen that blue urines and blue sediments have been known to occur since time immemorial, and that any urine when treated with mineral acids will permit of the extraction of a blue coloring-matter, which has received different names by different observers, viz., Prussian-blue, urocyanine, cyanourine, harnblau, uroglaucine, choleraic urocyanine, and which upon more detailed examination has been definitely demonstrated to be indigo-blue, being one of the products of decomposition and oxidation of a colorless mother-substance, present in every urine to a greater or less extent, which had been named indican by Schunck, its discoverer,

and which has been shown to be identical with the uroxanthine of Heller and Thudichum's choleraic-urocyaninogen.

The experiments of Schunk were fully confirmed by Hoppe-Seyler (Virchow's *Archiv*, 1863, vol. xxvii. pp. 388–392) in 1863, who demonstrated the constant presence of indican in over a hundred human urines, and also in such of carnivora and herbivora. Its formation Hoppe-Seyler regards as a probable function of the kidneys, since in his examinations of the spleen, liver, pancreas, muscles, blood, and kidneys traces were only found in the latter organs.

The same observer also mentions the occurrence of a large amount of indican in a brown urine obtained from an individual afflicted with a melanotic carcinoma of the orbit.

While Schunck, however, regards indican as a glucoside and as identical with vegetable indican, a view against which Hoppe-Seyler had already spoken, Baumann was the first to demonstrate that no sugar is formed in the process of decomposition of animal indican, but sulphuric acid and a compound belonging to the indigo-group, which had been previously found as one of its products of decomposition by Nencki (Baumann: *Ber. der Deutsch. chem. Gesellsch.*, vol. ix. p. 54; Pflueger's *Archiv*, vol. xiii. p. 307; *Zeitsch. für physiol. Chemie*, vol. i. p. 60); and in 1879 Baumann, in conjunction with Brieger (*Zeitsch. für physiol. Chemie*, vol. iii. p. 254; *Ber. der Deutsch. chem. Gesellsch.*, vol. xii. p. 2166) and Thiemann (*Ber. der Deutsch. chem. Gesellsch.*, vol. xii. p. 1098; *Ibid.*, p. 1192; *Ibid.*, vol. xiii. p. 408), was able to demonstrate that urinary indican is a combination of the conjugate sulphate of a hydroxylated indol with an alkali, which they termed indoxyl-sulphate, the term indican to be restricted to the indigo yielding substance of plants, viz., Isatis tinctoria, etc.

In the meantime indol had been shown to be the mother-substance of the indigo-group by Baeyer. Kuehne (Virchow's *Archiv*, vol. 39) had found a substance among the ultimate products of albuminous digestion by means of pancreatic juice, which he regarded as indol, and Radziewsky (Dubois-Reichert's *Archiv*, 1870, Heft i.) showed indol to be a normal and constant constituent of the feces, to which in part the disagreeable odor of the latter is due, so that it was not unnatural for Jaffe (Pflueger's *Archiv*, vol. iii. p. 448) to express the idea that the indol formed in the intestines should be regarded as the source of the urinary indican and the indigo obtained therefrom.

The proof for this view was brought forth by the experiments of Masson ("Des matières colorantes au point de vue physiologique;" Dissertation, Berne, 1874) in 1874, who, working under Nencki, found that the elimination of indican is increased in rabbits after subcutaneous injections of indol, an observation which was confirmed later on by Jaffe, and not originally made by him, as is usually stated.

The question now naturally arises, How is indol produced? and it is Nencki especially (*Ber. der Deutsch. chem. Gesellsch.*, vol. ix. p. 1593) to whom we are indebted for the solution of this problem. In 1874 he found indol to be a normal product of intestinal digestion, and expressed the view that its formation was the result of bacterial activity.

Koukol-Yasnopolsky (Pflueger's *Archiv*, vol. xii. p. 78) confirmed Nencki's work and found indol to be a constant product of albuminous putrefaction in alkaline media.

In a later communication Nencki (*Ber. der Deutsch. chem. Gesellsch.*, vol. ix. p. 299) definitely declares indol to be a specific product of albuminous putrefaction in the presence of organized ferments, in accordance with which Kuehne and Huefner find that no indol is formed when albuminous material is digested with pancreatic ferments in the absence of putrefactive processes.

Salkowsky (*Ber. der Deutsch. chem. Gesellsch.*, vol. ix. p. 408), on the strength of experiments made by Hoppe-Seyler and his pupils (Tuebinger, *Med. Chem. Untersuchungen*, vol. iv.; Pflueger's *Archiv*, vol. xii. p. 1), in which the formation of indol was observed from albuminous material kept under ether, thinks that the non-organized ferments, as well as the organized, are capable of causing the formation of indol, and that the intestinal tract is hence not the only source of the indican of urine, but that the body-tissues must be regarded as a second source of its formation.

That the experiment of Hoppe-Seyler, referred to, and hence the views of Salkowsky are erroneous, the former being probably referable to some technical errors, is proved by the following facts: According to Senator (*Zeitsch. für physiol. Chemie*, vol. iv., 1880), indican does not occur in the urine of newly born infants which have not as yet received nourishment, a point strongly in favor of Nencki's teachings, putrefiable substances being present, but no putrefactive organism, an observation moreover with which the chemical composition of meconium stands in perfect accord.

Tuczek's (*Neurologisches Cbl.*, 1884, p. 307; *Arch. für Psych. und Nervenkrankh.*, vol. xv. Heft 3) observations on abstinence in cases of insanity, where indican was only then observed in the urine, when albumin, even in minimal amounts, was ingested, but was otherwise absent, also speaks strongly against Salkowsky.

There should also be mentioned a case of Dr. Rabbas, reported by Mueller: A patient, who had been twelve days without food, eliminated only 0.000345 per cent. of indican, spectroscopically determined, the ordinary method showing no indican whatsoever.

The fact that high fever is not necessarily accompanied by an increased degree of indicanuria, as pointed out by Jaffe already, is also an important factor against Salkowsky's views. Salkowsky, it is true, was

unable to confirm the absence of indican from the urine of dogs at least, finding an elimination of $\frac{1}{2}$ mgrm. from the second to the fifth day of starvation, as compared with 17 mgrms. per diem while being fed with meat. (*Ber. der Deutsch. chem. Gesellsch.*, vol. xii. p. 138.)

Von den Velden likewise observed that in a dog which had been without food for five or six days at a time the conjugate sulphates had only diminished to one-half. Jaffe (*loc. cit.*) cites a case of complete occlusion of the œsophagus, owing to the presence of a carcinoma, in which no nourishment had been taken for eight days preceding death, and in which 17 mgrms. of indigo were demonstrated nevertheless on the day of death. As far as the latter case is concerned, a possible source for the indol-production could be sought for in the process of necrosis of the carcinomatous material, a point which Jaffe did not exclude.

For an explanation of Salkowsky's cases it is not necessary to refer the production of indol during starvation to a decomposition of pancreatic tissue, referable to the activity of micro-organisms located in the pancreas, according to Tiegel and Billroth (Virchow's *Archiv*, vol. lx. p. 453), and as suggested by Weiss (Ibid., vol. lxx. p. 80), but a very much more probable source for the production of indol in these conditions we find in the so-called "Hungerkoth," secreted by the intestinal mucous membrane, according to Voit, to the amount of 0.66–6.4 grammes residue, with 5.04–7.96 per cent. of nitrogen. The question may, however, still be asked, Why is it that Salkowsky was able to demonstrate indican in the urine of starving dogs, while in starving man no indican has been observed? An explanation of this apparent incongruity may be found in the experiments of Mueller (*loc. cit.*), which appear to indicate quite conclusively that the conditions in man and animals cannot be alike during hunger.

The final blow, however, which Salkowsky's theories received came from Baumann, who succeeded in absolutely disinfecting the intestinal tract in a dog by means of large doses of calomel, when all traces of indican, and for that matter of phenol and paracresol, dissappeared from the urine. The more recent experiments from Baumann's laboratory finally fully confirm the view that indol in health and disease is only formed in the intestines, provided that resorption of decomposing pus is not taking place in any part of the body, in which case a second source of indol and a corresponding indican-formation would exist.

What has thus been shown to be true for indol, viz., indican, is likewise true for phenol and paracresol, etc.; in other words, for all the known conjugate sulphates occurring in the urine, so that the degree of intestinal putrefaction may be directly measured by the elimination of these bodies in the urine. Any factor, then, that will bring about an increased degree of intestinal putrefaction will at the same time call forth an increased elimination of conjugate sulphates.

The question now naturally suggests itself: What is it that keeps the degree of intestinal putrefaction in what may be considered as the physiological limits?

There appears to be but little doubt at the present time that the free hydrochloric acid of the gastric juice is the active agent in this direction.

The Abbé Spalanzani, already (*Experiences sur la digestion.* Trans. by Senebier, new edition, Genève, 1784, pp. 94, 97, 145, 320–330, cit. by Bunge in his *Physiol. und pathol. Chemie*, 1889, 2d ed.; German translation, also, Leipzig, 1875), more than one hundred years ago, had observed antifermentative properties in the gastric juice. Small pieces of meat, covered with gastric juice, resisted putrefaction for days, while such as were left exposed to the air, when only covered with water, very soon emitted a most offensive odor. Spalanzani similarly observed a snake that had swallowed a lizard, and upon opening the stomach of the same sixteen days later the lizard, of course, was found partly digested, but manifesting no odor that could possibly be referred to putrefactive processes. A truly germicidal action on the part of the gastric juice was likewise observed by Spalanzani, for when he introduced meat already undergoing the process of putrefaction into the stomach of certain animals, this meat very soon had lost its putrefactive properties.

That the gastric juice thus possesses very marked antiseptic and germicidal properties is thus very apparent, and, remembering the fact that the mineral acids must be reckoned among the most powerful antiseptics, the supposition that the antiseptic properties of the gastric juice are referable to the presence of free hydrochloric acid appears very justifiable.

Sieber, working under Nencki (*Journ. für prakt. Chemie*, 1879, vol. xix. p. 433), showed, as a matter of fact, that when 50 grammes of hashed meat were exposed to the open air, with 300 c.cm. of 0.1 per cent. of hydrochloric acid, cocci and bacteria were observed in small numbers only after twenty-four hours, while with 0.25 per cent. a few quiescent organisms were only observed on the seventh day, and with 0.5 per cent. there was no sign whatsoever of putrefaction on the seventh day.

Micquel arrived at similar results (*Cbl. für allgemeine, Gesundheitspflege*, 1884, vol. ii. p. 403), finding that 0.2–0.3 gramme of a mineral acid suffices for the purpose of preventing putrefaction in 100 c.cm. of bouillon.

Schmidt (Bidder und Schmidt, *Die Verdauungssaefte und der Stoffwechsel, Mitau*, Leipzig, 1852, pp. 44, 45) determined the amount of free hydrochloric acid in the gastric juice of the dog as 0.25–0.42 per cent., with 0.33 as an average.

Dionys Szabo in Hoppe-Seyler's laboratory (*Zeitsch. für physiol.*

Chemie, 1877, vol. i. p. 155) found 0.3 per cent. in man. In other words, we find a degree of acidity in the gastric juice referable to free hydrochloric acid that has been shown to be necessary for the prevention of putrefactive processes.

Bunge (*Phys. und path. Chem.*, 2te Aufl., 1889) strongly advocates this function of the stomach, and in fact regards it as its most important one.

Granting the correctness of this hypothesis, an increased degree of intestinal putrefaction (a certain degree will, of course, exist in consequence of the development of certain spores that have not been destroyed by the action of the gastric juice) should of course result whenever the acidity of the gastric juice falls below a certain level or is entirely annihilated. Such has actually been found to be the case.

Kast ("Ueber die quantitative Bemessung der antiseptischen Leistung des Magensaftes." Festsch. zur Eroeffnung des neuen allgem. Krankenhauses, Hamburg, 1889, ref. to in Maly's *Jahresb.*, 1889, p. 271) working in Baumann's laboratory was able to demonstrate a largely increased elimination of conjugate sulphates, following the neutralization of the acid gastric juice with large doses of bicarbonate of sodium, as is evident from the following tables:

1. NORMAL DAYS.[1]

C.CM.	H_2SO_4 in 50 c.cm. as $NaSO_4$.		In 24 hours as $NaSO_4$.		
	A.	B.	A.	B.	A : B.
1500 . . .	0.1545	0.0100	4.635	0.3	15.4
1700 . . .	0.1140	0.0110	3.960	0.374	10.3
1800 . . .	0.1100	0.0668	3.960	0.244	16.1
1700 . . .	0.1045	0.0085	3.553	0.289	12.5

2. FROM NOW OFF 13 GRMS. OF BICARBONATE OF SODIUM DAILY.

C.CM.	H_2SO_4 in 50 c.cm. as $NaSO_4$		In 24 hours as $NaSO_4$.		
	A.	B.	A.	B.	A : B.
2000 . . .	0.0810	0.0213	3.240	0.852	3.8
1900 . . .	0.0667	0.0138	2.534	0.524	4 8
2100 . . .	0.0567	0.0195	2.381	0.819	2.9
1820 . . .	0.1450	0.0225	5.221	0.846	6.1

To these experiments of Kast, v. Noorden (*Zeitsch. für klinische Med.*, vol. xvii.) objected upon the grounds that in the experiments of Kast abnormal conditions had been established in consequence of the introduction of large amounts of alkalies, a much more favorable basis for the development and resorption of putrefactive products, viz., for the formation of conjugate sulphates, being thereby given than is usually to be found in the mere absence of free hydrochloric acid, basing his conclusions upon experiments made in a series of patients where, in the

[1] "A" indicates the amount of mineral sulphates; "B" that of the conjugate sulphates.

absence of free hydrochloric acid, but with a normal motility of the stomach, a decided increase in the elimination of conjugate sulphates was not observed, the relation of A : B in his cases being the following:

	1	2	3	4	5	6	7	8
A : B . .	17.9	12.4	7.6	13.8	5.1	10.5	4.8	11.2

An observation furthermore has been made by Boas (*Deutsch. med. Woch.*, 1891, No. 28) in a case of duodenal stenosis, in which succus entericus was constantly present in the stomach; where gastric juice could thus be definitely excluded; where the relation of A : B was found to vary between 21.9 and 5.36.

The experiments of Mester, however (Inaugural Diss., 1893, and *Zeitsch. für klinische Med.*, vol. xxiv. pp. 441–457), in which the objectionable features of those of Kast were eliminated gave rise to the same conclusion. Mester's conclusions may be summarized as follows: Intestinal putrefaction is brought about normally by the entrance of putrefactive organisms into the digestive tract together with the food, the intensity of the same depending upon the amount of free hydrochloric acid present. It is thus increased in the absence of free hydrochloric acid, which becomes the more evident when putrid meat, less so, when meat carrying but a small number of putrefactive organisms, serves as nourishment, while with a normal amount of free hydrochloric acid, even within wide limits, such differences in the quality of the food remain without influence upon the process of digestion.

Equally suggestive were the observations of Wasbutzki (*Arch. für. exp. Path. und Pharmak.*, vol. xxvi.), the result of which is the following: In cases of intense bacterial fermentation in the stomach an increased elimination of conjugate sulphates results, the cases being such of subacidity or anacidity of the gastric juice; a diminished elimination of conjugate sulphates, on the other hand, was noted in cases of torular fermentation, *i. e.*, such in which hyperacidity and even hypersecretion existed. Two interesting exceptions to this general rule are recorded by Wasbutzki, in both of which a normal and even a diminished elimination of conjugate sulphates was found, associated with anacidity and a simultaneous occurrence of fermentative processes. In both cases much lactic acid and butyric acid were found, and Wasbutzki expresses the opinion that the abnormal quantities of acid in these cases were able to carry on the functions of the free hydrochloric acid, an observation which I have been able to confirm in several cases, and an explanation with which I am inclined to agree.

The cases of Biernacki (*Deutsches Arch. für klin. Med.*, vol. lxix.), finally, in which an increased degree of intestinal putrefaction was found to be associated with a deficiency in the amount of free hydrochloric acid in cases of chronic Bright's disease, likewise support the view that the elimination of conjugate sulphates must be regarded not only as an

index of the degree of intestinal putrefaction, but also of the acidity of the gastric juice, or rather of the amount of free acid contained in the same.

Unfortunately, however, it will probably be but very rarely that a quantitative estimation of the total and conjugate sulphates can be carried out by the practising physician, one single determination requiring at least from five to six hours of time, the use of delicate scales, etc.

The question, hence, naturally suggested itself: Does the amount of free hydrochloric acid in the gastric juice affect the indol-producing organisms in exactly the same manner as the phenol-producers, for example? In other words, is an increased elimination of indican from the urine, referable to subacidity or anacidity of the gastric juice, invariably associated with a similar increase of the phenol sulphate—for the others, occurring in mere traces, need not be considered at all in this connection—or are there cases in which increased or diminished indicanuria is associated with diminished or increased phenoluria respectively?

Were an increased elimination of indican invariably associated with an increased elimination of phenol, and a diminished elimination of indican with a diminished elimination of phenol, it is apparent that in that case a quantitative estimation of either would be sufficient for the purpose of deciding the question whether hyperacidity, a normal acidity, subacidity, or anacidity of the gastric juice exists.

While formerly Salkowsky (*Virchow's Archiv*, vol. lxxiii. p. 409) taught that urines rich in indican were at the same time also rich in phenol, there seems to be some doubt as to the correctness of this view, according to Brieger (*Zeitsch. für physiol. Chemie*, vol. ii. p. 256), and the following cases taken from Brieger may serve as an illustration:

CASE IX.—R., aged fifty-four years, suffered for ten years from chronic gastritis (loss of appetite, nausea without vomiting) and anæmia of considerable severity; without the existence of a true cachexia, however; in the beginning bromine-water only occasioned a slight turbidity in the distillate of the urine, while later on, when the patient had improved, his appetite having returned, 0.0223 gramme of tribromophenol, equivalent to 0.0061 gramme of phenol, was obtained from the urine of twenty-four hours. A considerable amount of indican was, however, present.

The same may be said of Case X., also the subject of chronic gastritis, in which only traces of phenol were found.

In Case XI., associated with increased indicanuria, 0.0030 gramme of phenol was found, the case being one of ulcer of the stomach.

In Case XII., also one of ulcer, the amount of phenol varied from 0.0152 to 0.0135 gramme.

Increased indicanuria, associated with an amount of phenol varying from 0.0174 to 0.0337 in one case of cancer of the stomach, and 0.0344

to 0.1130 gramme in another, was likewise observed (Cases XIII. and XIV.).

Later on it appears that Salkowsky himself changed his opinion, so that it may now be regarded as a settled point that increased indicanuria is not necessarily accompanied by increased phenoluria.

The question now suggested itself: Does a diminished elimination of indican in digestive diseases ever accompany an increased elimination of phenol?

This question, as far as my own experiments go, I think I can definitely answer in the negative, for not in a single case in which I was able to demonstrate a diminished elimination of indican have I been able to determine the existence of increased phenoluria, excepting cases in which an active resorption of decomposing pus was taking place from any of the large body-cavities.

An increased phenoluria, on the other hand, not infrequently accompanies an increased indicanuria, and this is especially the case in cases of cancer of the stomach, and also quite constantly observed in cases of general peritonitis and ileus, but of these conditions it is not at present my object to speak.

Having thus determined the fact that an increased elimination of indican may or may not be accompanied by an increased elimination of phenol in digestive diseases, and that a diminished elimination of indican under the same conditions is not accompanied by an increased elimination of phenol, the conclusion that the increased degree of intestinal putrefaction in cases of subacidity and anacidity of the gastric juice is largely due to an increased formation of indol, and that *the indican elimination may hence be regarded as running a course parallel to the degree of antiseptic—viz., germicidal—activity of the gastric juice*, i. e., *the amount of free hydrochloric acid, appears to suggest itself.*

The correctness of this view I have been able to test in a very large number of instances that have fallen under my observation in the course of the last three years.

The gastric juice, it is true, could not be examined in every individual case; the records of those, however, in which this was done and the histories of the others, I think, will be fully convincing, and call for a repetition of my experiments, leading, I hope, to the general adoption of the hypothesis herein set forth, and the general acceptance in practice of so simple a method to obtain an insight into the condition of the gastric juice and the degree of intestinal putrefaction.

I do not wish to convey the impression, however, that with the adoption of this method the use of the gastric tube for diagnostic purposes should be abandoned. From a careful analysis of the urine, it is true, many points of undoubted value can be obtained regarding the condition of stomach and small intestine, etc., but nevertheless the

information thus obtained cannot as yet be so complete as that furnished by a direct examination of the stomach contents. *As confirmatory evidence, however, and as a method to be employed where for any reason the use of the tube is either contraindicated or impractical, the same, I am sure, will be found to be of decided value.*

(To be continued.)

NEURALGIA OF THE RIGHT TRIGEMINAL NERVE OF EIGHT YEARS' DURATION;

EXCISION OF THE THREE DIVISIONS AT THE GASSERIAN GANGLION; RECOVERY, WITH PARTIAL DESTRUCTION OF THE GANGLION.

By J. T. Eskridge, M.D.,

PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF COLORADO; NEUROLOGIST TO THE ARAPAHOE COUNTY, ST. LUKE'S, AND DEACONESS' HOME HOSPITALS;

AND

Edmund J. A. Rogers, M.D.,

PROFESSOR OF SURGERY IN THE UNIVERSITY OF DENVER; SURGEON TO THE ARAPAHOE COUNTY, ST. LUKE'S, ST. ANTHONY'S, AND DEACONESS' HOME HOSPITALS.

History and Examination by J. T. Eskridge, M.D.

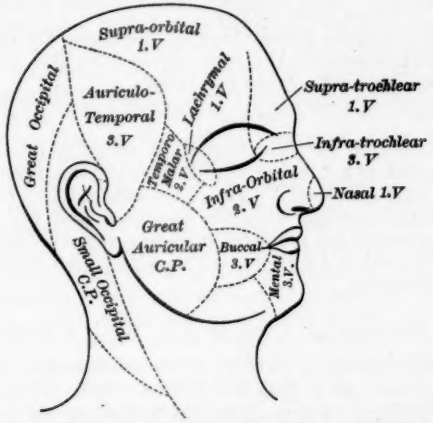
James L., aged forty-five years, born in Ireland, single, engaged as a laboring miner in Colorado eighteen years, has been suffering from neuralgia of the right trigeminal nerve since March, 1885. His father was very intemperate in his youth; his mother died in childbirth. No nervous or mental diseases in the family. One brother died of consumption. In childhood the patient's health was excellent. He denies syphilis and alcoholism. Fifteen years ago he suffered from what his physician called scurvy. He had been living on salted food, and his feet and legs swelled, and he was weak. In 1883 he had an attack of typhoid fever. From 1883 to 1885 he suffered from rheumatic pains in joints while working under ground in wet mines. In February, 1885, he had a severe attack of rheumatism, with swollen and painful joints. The wrist, elbow, shoulder, knee, and hip-joints were involved. In March, 1885, he began to have pain in the region of the right inferior dental nerve. The attack was extremely severe for three weeks, and after this the pain was constant, but not so severe. The pain was limited to this nerve. Within a year from the time the neuralgia first began it had extended to the region of the face in front of the right ear, and involved an area there one or two inches in diameter. After the extension of the pain to the region of the right ear it became intermittent. He would suffer for a few days from severe pain in the inferior dental nerve, the next day from a dull pain in front of the right ear, when he would be free from pain for several days. The pain in 1889 occasionally extended to the superior maxillary nerve. The first division of the fifth cranial nerve was never involved. At this time the pain became constant again, with periods of severe exacerbation. Before this time he

had several teeth extracted on the right side from the lower jaw, but he obtained no relief. During the summer of 1889 he had all his remaining teeth—twenty-three in number—extracted. This seemed to intensify his suffering, and his pain then was not only constant, but severe. The next three years were spent in seeking relief from his intolerable agony, but he never obtained more than three or four weeks' freedom from pain at any one time. He first consulted me on November 25, 1892. He is a heavily built, muscular man, and weighs about two hundred and twenty-five pounds. On careful examination no symptoms of impaired health are found outside of the regions of distribution of the second and third divisions of the right fifth cranial nerve. The absence of natural teeth, whose place has not been supplied by artificial ones, has resulted in permanent contractures of the masseter muscles, and it is impossible for him to open his mouth to the normal extent. The gums on the right side of the lower jaw and the lower lip on the right side are hyperalgesic, and the slightest contact of substances, especially if their temperature is cool, often causes violent paroxysms of pain. The gums have remained so sensitive since the extraction of his teeth that it has been impossible for him to endure the presence of a plate for artificial teeth, and during the last three years he has been compelled to live on liquid or semi-solid food. Tactile-sense is a little blunted on the lower lip on the right side. Temperature-sense on the right side of face, especially on the lower portion, remains about normal, except an increased sensitiveness for cold. Vision, hearing, and smell seem to be nearly equal on the two sides. Taste is more acute on left side. As he had undergone the various forms of treatment for relief of neuralgia of the fifth nerve, I advised him to have the three divisions of the nerve excised at the Gasserian ganglion.

He entered St. Luke's Hospital the next day with the expectation of having this operation performed, but after he had remained in the hospital a few days his courage began to fail him, and he asked to have the superficial operation, of which he had heard, instead. I placed the patient under the care of Dr. Edmund J. A. Rogers, one of the surgeons of the hospital, and he, in the latter part of November (1892), excised a portion of the right inferior dental nerve in the dental canal. This procedure was acquiesced in by Dr. Rogers and myself, the more readily because all his paroxysms of pain started in the inferior dental nerve. At the same time we informed our patient that nothing more than temporary relief from pain would be likely to follow such an operation. For four or five days after this operation he was entirely free from pain. For the next two months, or until about the 4th or 5th of February, 1893, he experienced a momentary shooting pain in the right side of the lower lip once or twice daily. During these two months he had no pain or sore feeling in the front of the right ear, the region which had been the seat of constant pain for several years. Early in February, 1893, he took a cold. Immediately the face pain began to increase. The right lower lip, which after the operation was completely anæsthetic, became the seat of constant pain. Although the sense of touch was absent, yet a cup placed to his lips caused intense suffering throughout the distribution of the right inferior dental nerve. The pain spread over the region supplied by the second division of the right fifth cranial nerve. The slightest motion of the lips was sufficient to cause a paroxysm of neuralgia; even the act of swallowing was attended with severe pain in the

second and third divisions of the nerve. After the middle of February he stopped work, and by the early part of March the suffering became so intense that he meditated suicide. Rather than take his own life, he decided to return to St. Luke's Hospital, and have the major operation

FIG. 1.



Normal distribution of the fifth nerve to the face. (From FLOWER.)

FIG. 2.

Deeply shaded area represents almost total anæsthesia in case operated upon; light area, partial anæsthesia.

performed. He entered the hospital the 9th of May, and the operation was performed on the 23d of the same month. Before the major operation he had grown quite nervous and depressed. The region of distribution of the right inferior dental nerve remained anæsthetic to touch,

the same as it was immediately following the excision of this nerve. Pain was limited to the second and third divisions of the right trigeminal nerve, the first division never having been affected. Immediately after the second operation he was relieved of pain, and he has remained entirely free from it up to the present date, September 12, 1893.

Present condition. Patient has gained several pounds in weight since the operation, and feels quite well.

It will be seen that the first division of the nerve was not completely excised. Taste is absent in the right anterior portion of the tongue. Smell is present and equal on the two sides.

Hearing: right, 1/12; left, 1/6. Tuning-fork is heard better in left ear.

Since the operation he has complained of an annoying sensation, which he describes as a "feeling that he is breathing through the right ear when the mouth is closed." He states that he has had a constant dull feeling in the right ear since the operation, and two weeks subsequent to the operation the sound of his voice began to be intensified in the bones in the front of his right ear. This sensation has increased, and at times it is annoying.

Condition of Eyes by Dr. E. C. Rivers.

The palpebral opening in the right eye is considerably wider than the left, and is apparent at a glance. The movement of the eyes is the same in all directions. Pupils equal and normal in size. Reaction to light and convergence normal. The sensibility in the right eye is very much reduced all over the cornea and conjunctiva, but everywhere present. Patient thinks it over one-half that experienced when left eye is touched in the same manner.

Vision: O.D., 20/100; O.S., 20/20.

Hy., 4.50 D., previously corrected.

Examination macroscopically and by oblique illumination shows:

Right eye: Cornea superficially cloudy throughout all that portion unprotected by the lids. The cloudiness is due to exfoliation of the superficial epithelial layers, and accounts for the diminution of vision, as when the pupil is dilated the vision improves to 20/70. The ophthalmoscope shows no abnormal condition of the rest of the optic media.

Left eye: Normal, except Hy.

When I examined the patient, about four weeks after the operation, there was no sensibility of the cornea of the right eye, and no cloudiness. Vision at that time was equal to the left eye—20/20. About the 20th of July I examined him again, and found the cornea insensitive everywhere except at the upper portion, at one point near the periphery, immediately above the middle of the cornea, where he could feel the contact of a probe.

Operation by Dr. Edmund J. A. Rogers.

The first operation, performed on November 28, 1892, was begun by a long free incision parallel to the ramus of the jaw and just beyond the face line. The flap was reflected forward, and the attachment of the masseter muscle scraped away from the broader portion of the jaw, just about the angle. A three-quarter-inch button was then trephined from the outer table of the jaw, and lifted to expose the canal.

The nerve was then hooked out and drawn from both directions, and about three-quarters of an inch excised. No antiseptic was used during the operation. The operation at the time was very satisfactory to the patient, and he left the hospital in a very happy frame of mind. There was considerable callus thrown out, but repair was so complete that when he returned to the hospital in May it was impossible from appearances to say which side had been operated upon. The two of my *confrères* who examined it both named the opposite side, as there were some old scars on the neck there from some early skin disturbances.

The agony that he suffered during the days that he was in the hospital before the second operation is beyond description. He would sit in a corner where no movement of air could reach him, and would not move, speak, or swallow if he could avoid it, on account of the severity of the paroxysm of pain which he endured.

On May 21st, after thorough preparation, he was placed on the table for the major operation. Chloroform was used as the anæsthetic, and he took it very badly. After the face incision had been made and the flap partly reflected, his heart failed almost completely, he became cyanosed, and death was imminent. With difficulty he was revived, but so slowly and so incompletely that it was decided that he could not stand the operation then. The wound was closed and dressed, and he was put back in bed, where in a few hours he fully recovered. On the 23d, two days later, the operation was again undertaken, ether being now used as the anæsthetic. We were assisted in the operation by Drs. Parkhill and Bagot, Dr. Atchison, of the resident staff, giving the anæsthetic. Rose's operation, as detailed by him, was closely followed, with few exceptions. The manual labor of the first part of the operation is very trying, and when the second portion is reached one has already done considerable manual labor. The internal maxillary artery was not ligated. It could easily be felt, and pulsation was visible by the electric illuminator; but it was not easily isolated, and after an aneurism-needle had been passed around it pulsation disappeared and did not return. No vessel was ligated throughout the operation. On tearing away the attached muscles from the base of the skull the blood oozed in slowly from all sides, and this, together with the great size of the patient's head (he requires a No. 8 hat), rendered it impossible to make any use of light in the deeper part whatever, and all the essential part of the operation had to be done by tactile sensation. The foramen ovale was easily made out and the nerves traced to it. I trephined well to the outer side of it, and then, with the chisel and mallet, cut through the intervening bone. I had hooks specially made from Rose's model, but found them too small to be of much service, working at so great a depth, and my only guide was tactile sense. Having made a free opening, by means of which I could easily feel the presumed site of the ganglion, I passed a sharply curved aneurism-needle under the ganglion and raised it from its bed. I then, by means of the sharp hook and other instruments, completely dismembered its substance down to my aneurism-needle. Being unable to see, this was a tedious and unsatisfactory proceeding. I then picked away the upper portion of what seemed to be the ganglion as high up as I dared go. I did not wash out the wound in any way, as the constant oozing of blood had kept the wound irrigated. I removed the coronoid process of the jaw entirely, and, to save time, followed Dr. Parkhill's suggestion of stitching the zygoma to the temporal fascia, instead

of wiring it. I closed the wound completely and dressed it. No antiseptic was used in the wound or in the dressing, and no vessels were ligated, the oozing being allowed to fill the wound as it was closed. The patient expressed the greatest sense of relief on coming out of the anæsthetic, one of his first expressions being that he "would rather undergo the operation once a week than endure the agony." Convalescence was slow and uncertain, but in the long run very satisfactory. His whole nervous system seemed to have received a shock which rendered its mechanism very uncertain. For a few weeks the patient seemed very hysterical. For slight causes he would become very emotional, and from very slight disturbances his temperature would vary many degrees. No symptoms of septic infection manifested themselves, and, surgically, the recovery was very satisfactory. When the wound was first dressed it was found completely closed, and has given no trouble since. I had photographs of his full and side face taken the day before the operation and taken again now. From these it can be seen that the disfigurement is very slight. The region about and below the zygoma is slightly sunken, but hardly enough to attract attention. The most trouble in the after-treatment was from the anæsthesia of the conjunctiva, it being a couple of months before it could be left uncovered without some irritation manifesting itself.

August 10, 1894, the patient writes that he has had no return of the pain, and all discomfort in the right ear and around it has disappeared.

A CASE OF CONCURRENT SARCOMA AND HIP-JOINT DISEASE.

By J. Torrance Rugh, M.D.,

INSTRUCTOR IN ORTHOPEDIC SURGERY AT PHILADELPHIA POLYCLINIC, AND ASSISTANT SURGEON TO THE ORTHOPEDIC DEPARTMENT OF JEFFERSON MEDICAL COLLEGE HOSPITAL.

The coexistence of two active diseases in the same part has been denied by some authors, but admitted by others as a rare occurrence. The doubt, which first existed, as to the true condition in the case to be described was rather increased by this fact, but the clinical history and the examination have indubitably proven that such coexistence is possible. The case was an attendant upon the Orthopedic Dispensary of Jefferson Medical College Hospital, under the care of Prof. H. Augustus Wilson. It is especially interesting on account of both its well-marked clinical features and its rarity, for while there is no hindrance to the development of a sarcoma at the site of a hip-joint disease, yet such a condition has seldom, if indeed ever, been reported.

The history is as follows:

W. W., aged nineteen years, was born in Austria, and a resident of this country for two years. The family history is negative as to tuberculosis or syphilis. The patient is of small stature, but not because of ill health, for his personal history was quite good until he was fifteen years of age. At that time he fell, striking heavily upon his right hip. He suffered somewhat for a few days, but gave no special attention

to it. Several weeks later, however, pain began in the same hip, and he complained of soreness and soon experienced difficulty in walking. These symptoms continued, with occasional periods of relief, for several months, until the soreness became extreme and enlargement of the part was observed. It gradually increased in size until one year after the receipt of the fall, when an abscess ruptured on the posterior surface just below the gluteal fold, and discharged a large amount of pus. Very great relief obtained after the contents had evacuated themselves, and he became stronger and healthier, but a sinus remained which constantly discharged purulent material. Within the next two years, or up to January 31, 1893, four other abscesses formed and opened at different points, showing that the diseased process was very much increased and that bony involvement was very extensive.

At this time he first came to the clinic, and was admitted to the ward of the hospital and prepared for an operation. On his admission his temperature was elevated, oscillating between 101° and 103°, and he had a marked hectic flush; the hip was very much enlarged; motion was absent, due partly to beginning ankylosis and partly to muscular rigidity; the skin was very tense and glossy; the veins were quite prominent over the affected region; and fluctuation existed at various points, while elsewhere the soft parts were hard and unyielding. The discharge from the sinuses was greatly lessened and the boy's general condition was quite serious.

On February 2, 1893, Dr. Wilson exposed the deep structures of the hip by a long external curvilinear incision immediately back of the great trochanter, and found several pockets filled with tubercular pus and fibrous detritus. These he thoroughly emptied and also removed a large amount of dead bone from the femur. The acetabulum and surrounding bone were so extensively involved in the diseased process that they were not disturbed. Free drainage was secured by tubes, and the wound sutured. The tubes were removed on the third day, and the wounds washed out thoroughly once or twice a day with peroxide of hydrogen, followed by bichloride solution, 1 : 2000, and then injected with a sterilized 10 per cent. emulsion of iodoform and olive oil.

He was discharged from the ward on April 6, 1893, and was dressed two or three times a week in the out-patient department. When discharged his condition was much improved, he having gained both in weight and strength, and being able to walk, without the aid of cane or crutches, five or six squares to and from his home.

In the latter part of December, 1893, my attention was directed to a slight enlargement about one and one-half inches below Poupart's ligament and partially encircling the anterior and inner surfaces of the right thigh. In another week this had increased in size, was quite hard, and had all the appearance of a beginning abscess, excepting that fluctuation was absent. By the end of the first week in January, 1894, the circulation of the leg became very much interfered with because of the constriction of the large vessels by the increasing swelling. In another week, a sense of fluctuation was detected at several points, but one marked feature of it was the absence of the elastic and expansive feel of the true abscess, the sensation being more like that of the trans-muscular wave; however, on account of the pre-existing ostitis, the steady and comparatively rapid increase in size and the apparent fluctuation, an abscess was diagnosticated by all who saw and examined it. The veins

were prominent; œdema was present, slight over the tumor, but very marked below it; the temperature, however, was not elevated above what it had been; pain and soreness were absent, as were also heat and redness.

On January 27th, Dr. J. P. Mann and I opened the supposed abscess at two points, one on the inner surface of the thigh and the other on the anterior surface, but found no pus. The finger introduced into the anterior incision came in contact with tissue which felt very much like a soft round-celled sarcoma. It was easily broken and easily penetrated with the finger, but not so readily as the caseated tubercular material or a recent inflammatory exudate. It seemed semi-organized and bled very profusely. Several pieces were detached, and upon examination thought to be sarcoma, both from appearance, which was quite characteristic, and from the history, which was then hastily reviewed. The uncertainty of the diagnosis, as well as the extensive involvement of the parts, caused us to refrain from further operative measures. The wounds were then closed with sutures and dressed antiseptically. The bleeding ceased upon closure, and as soon as the effects of the anæsthetic passed away the patient went home.

FIG. 1.

Front view of tumor (taken February 15, 1894). The opening of a sinus from the hip-joint disease is seen in the groin.

Some detached portions were examined microscopically by Prof. W. M. L. Coplin and Dr. D. Braden Kyle, and while neither would say positively that the tissue was sarcoma, yet both agreed that it had more of the characteristics of such than of inflammatory tissue, which it resembled. The doubtful point was the lack of uniformity in the condition of the walls of the bloodvessels, some of the vessels in the section showing distinct walls, while others had none, which may be explained by the pre-existing inflammatory action causing vascular thickening.

The clinical history is undoubtedly that of sarcoma, for the list of local and constitutional symptoms entailed in the production of so extensive an inflammatory exudate were all absent, while the steadily rapid development, prominent veins, apparent fluctuation (so often

present in sarcomata), absence of pain, soreness, or constitutional disturbances, the non-involvement of neighboring glands, the macro- and, in part, the microscopical examinations all point toward sarcoma.

FIG. 2.

Side view of tumor (taken at same time as Fig. 1). Two sinus-openings and part of the scar of the operation are seen.

On February 13th, when I removed the dressings, there existed a large fungating mass at the site of the anterior incision. It was about one and a half inches in diameter, and was raised one-half inch or more above the skin, and from one of its vessels the blood spurted at least a

FIG. 3.

Front view (taken April 20, 1894), showing the increase in size of the masses of tumor, also the abdominal enlargement from extension of the tumor.

foot, besides oozing very freely. The entire limb was very much swollen and the whole hip was enlarged. Several surgeons to the hospital saw it, and all unqualifiedly pronounced it sarcoma (Figs. 1 and 2).

The situation of the growth and the complication of the tubercular

ostitis involving the femur and ilium, with its accompanying ankylosis, precluded a hip-joint amputation. Extirpation was impossible, because of the involvement of the large vessels of the thigh and the size of the tumor. Erysipelatin injections were suggested, but not tried.

The patient continued to attend the dispensary, where the foul and fungating mass was dressed. It increased rapidly in size, and his condition became quite critical. Admission to the Philadelphia Hospital was secured for him, but he remained there only two weeks, and again came to our clinic (Figs. 3 and 4). At this time the skin of the thigh and leg threatened to break because of the œdema; he lost flesh rapidly, and had a characteristic waxy countenance; he could scarcely walk, and suffered much pain; there were no hemorrhages, except when the dress-

FIG. 4.

Side view (taken April 20, 1894), showing the fulness of the hip as compared with Fig. 2.

ings were removed. He died on May 6, 1894, after an uncontrollable hemorrhage from the large mass of the tumor, lasting about twenty-four hours.

A post-mortem examination showed extensive caries of the acetabulum and ilium and upper third of the femur (including the head and neck), with pockets of caseated material, all of which was of a distinctly tubercular character.

The origin of the tumor was first thought to be from the connective tissue about some of the sinuses, but this proved to be incorrect, and whether the pre-existing ostitis had aught to do with the growth could not be determined.

The sarcoma began in the femur, at a point one and a half or two inches below the junction of the neck with the shaft, and spread through the contiguous tissues to the joint and into the pelvic and abdominal cavities. The bone at the point of origin of the tumor was quite soft and spongy, and had so lost its characteristic shape and structure that a medullary cavity or surrounding lamina of dense bone could not be recognized. The large vessels were much constricted from the pressure of the mass, the large saphenous veins being almost closed.

REVIEWS.

L'Hystérectomie Vaginale Contre le Cancer de L'Utérus et les Affections non-Cancéreuses. Par L. Gustave Richelot, Professeur Agrégé a la Faculté de Médecin de Paris, Chirurgien de l'Hôpital Saint Louis. Pp. xvi. 446. Paris: Octave Doin, éditeur, 1894.

Vaginal Hysterectomy for Cancer and Non-cancerous Affections of the Uterus. By L. Gustave Richelot, etc.

This monograph, from the pen of one who is entitled to speak with authority, will serve to stimulate the interest in vaginal hysterectomy which has been recently awakened in America. Being almost entirely a record of the author's personal experience, it is more valuable for reference than are many of the papers and discussions on this subject. The introductory sections on the history of the operations in France (or rather in Paris) are followed by brief analyses of the writer's own cases—forty-four hysterectomies for cancer, with three deaths, and two hundred and nineteen for non-cancerous affections, with eleven deaths, the total mortality being 5.1 per cent. Taking up the subject of pelvic suppuration first, he devotes several pages to an analysis of the fatal cases. Among the accidents he notes only two cases in which the rectum was injured, and one of vesico-vaginal fistula, certainly a remarkable record. The section on the remote results of hysterectomy will be read with especial interest by those who fear that total extirpation for pelvic suppuration is a palliative rather than a curative procedure. The author states positively that the climacteric disturbances have not been serious, pain has been relieved or removed, and in no instance has there been loss of sexual feeling. Operations for hæmatosalpinx, hydrosalpinx, and salpingo-oöphoritis are then discussed, with a section on "complicated retroversion." By the latter term the writer signifies retro-displacement of the uterus, with prolapsed and adherent tubes and ovaries, giving rise to severe symptoms, which cannot be relieved by ordinary treatment. He admits that six uteri were removed which did not belong to this category, since they were retroverted, but non-adherent, and offers as an excuse the fact that the cases were aggravated, of long-standing, and the patient near the climacteric. It must be confessed that American readers will hardly accept these arguments as valid.

Under the head of "Minor Lesions" are included salpingitis, cystic ovaries, "painful metritis," in short, cases in which the pelvic symptoms are more severe than are explained by the anatomical changes found in the organs removed, and in which other treatment, surgical and non-surgical, has failed to give relief. Sixteen hysterectomies were performed on this indication, with no deaths.

Considerable space is devoted to the subject of extirpation of the uterus and adnexa as a last resort in pelvic neuralgia, since the writer

evidently feels that he is open to criticism in this direction. Seventeen cases are reported, with two deaths.

Secondary vaginal hysterectomy (after previous castration), hysterectomy for fibro-myomata and for prolapsus are considered at length. In sixty-seven operations performed for these conditions there was only one death.

The second division of the book deals with the indications for the vaginal operation and its advantages over cœliotomy.

The concluding portion, devoted to technique, will be read with especial interest. Three classes of cases are recognized from a surgical standpoint—those in which the uterus is movable, in which the uterus and adnexa are more or less adherent, and cases of fibro-myomata, which can be removed per vaginam, either entire or by morcellation. The various steps of the operations in each are described with great minuteness.

A movable uterus should be removed, he thinks, in five or six minutes. He first dissects off the bladder, but does not incise the vesico-uterine fold of peritoneum, then enters Douglas's pouch, retroverts the uterus, passes two fingers over the fundus while making downward traction on the cervix, and cuts upon their tips as they are inserted into the anterior fornix. The entire left broad ligament is then seized with a single clamp, if possible, and is divided close to the uterus. An additional clamp may be necessary to secure the upper portion of the ligament. The opposite ligament is then clamped and divided and the uterus is removed. If very large, it may be necessary to remove it by morcellation. Small forceps are used to secure bleeding points and sometimes to unite the edge of the peritoneum to that of the vagina. The clamps (which, the author admits, cause considerable pain) are removed in forty-eight hours. Secondary hemorrhage is a rare accident. The tampon is not disturbed for five or six days, better seven or eight. The patient usually leaves her bed at the end of two weeks and is discharged at the end of the third.

The description of removal of the adherent uterus is somewhat involved. Douglas's pouch is first opened and a long-bladed retractor is introduced through the incision, the bladder having previously been dissected off and held upward by a second retractor. Guided by the index-finger in front and the middle finger behind each broad ligament, their lower portions are clamped and divided. Adhesions of the adnexa are then separated and the uterus is removed by morcellation, in the following manner: The cervix is split transversely with scissors and as much of the posterior flap as possible is excised; traction is then made on the remaining flap, which serves to depress the anterior surface of the body of the uterus. A large portion is removed with the anterior flap. The remainder of the organ is drawn downward, and, if necessary, is divided vertically or obliquely; traction is made on each half, and smaller sections can now be excised from the centre of either. As soon as the vesico-uterine fold is encountered, it is easy to protect the bladder from injury. The cornua having been reached, the adnexa can be clamped and the fragments of the uterus removed. The diseased adnexa, pus-collections, etc., then receive attention. A careful description of this important step is given, even the method of protecting the healthy peritoneum from contact with septic fluids.

In the section on the removal of fibroid uteri the difficulties of the operation are somewhat under-rated. The same criticism applies to the separation of intestinal adhesions.

A condensed history of all the writer's cases concludes this valuable monograph, which, though evidently written from the standpoint of an enthusiast, contains much that is interesting and instructive. While his own results may justify the author in regarding cœliotomy for pelvic tumors and suppuration as an operation which is rarely indicated, the conservative reader will infer that his success has led the eminent surgeon to give his operation a wider application than would seem to be justifiable. However ingenious may be his arguments, few will be disposed to remove the uterus for such indications as intractable retroversion and pelvic neuralgia.

The style is clear and pleasing, though at times the author indulges in the prolixity for which his countrymen are famous. H. C. C.

DIFFICULT LABOR. By G. ERNEST HERMAN, M. B. Lond., F. R. C. P., Senior Obstetric Physician to the London Hospital, etc. With 162 illustrations. Pp. 443. New York: Wm. Wood & Co., 1894.

THE topic of this book is most seasonable, and its interesting style and the practical manner in which it deals with some difficult points in obstetrics should make it a welcome addition to the library of both the obstetrician and the general practitioner. The illustrations are abundant, fairly well executed, and serve fairly well in elucidating the text. The volume is of convenient size and clearly printed.

The subject-matter of the book begins with a definition of natural labor, and an appropriate paragraph urges the importance of early diagnosis. The first abnormality to receive attention is occipito-posterior positions. Here the importance of diagnosis by palpation is urged, and the physician is advised to bring the head into a favorable position by external manipulation. In treatment the importance of rotating and flexing the head with the hand is dwelt upon, followed by the application of the forceps. The author does not advise forceps rotation in these cases, but does not mention the fact that intermittent traction with Simpson's forceps will often result in rotation of the head, the forceps remaining applied to the sides of the pelvis. In treating of face presentations advice is given to change them to vertex, if possible. In cases where the chin is behind it should be turned to the front by the hand, and delivery completed with forceps. Failing in this, perforation is justifiable. A separate chapter is given to the various mouldings of the head which occur in different presentations, and appropriate illustrations are appended.

In treating of breech presentations the usual methods of delivery are described, the author strongly condemning the use of forceps. He does not consider it advantageous to draw down a loop of the cord, and has seldom found it necessary to place a loop of cord at the extremity of one of the oblique diameters of the pelvis. In delivering the after-coming head he prefers a combination of the finger in the mouth, and pulling down the jaw with suprapubic pressure. He considers best of all

the use of forceps. In transverse presentations the subject is treated fully, and various methods of delivery are well illustrated. Abnormalities connected with the cord, or with the small parts of the fœtus receive adequate attention, as is also the case with the subject of twin pregnancy. An interesting account is given of dystocia from monstrosities.

In treating of inertia of the uterus a distinction is made between primary and secondary inertia. By the former is meant that labor pains are weak, or few, from the beginning of the labor, while the latter refers to inertia from exhaustion. The method of treatment for these two conditions is held to be radically different. For the first, the duty of the obstetrician is to hasten delivery, either by forceps, or traction upon the legs or breech. In secondary inertia it is held that to end the labor will almost invariably bring on post-partum hemorrhage. It is stated that ergot has no effect upon secondary inertia, because the nervous power of the uterus is exhausted. Opium, used freely, is recommended for this condition. Our experience in this regard has differed considerably from that of the author. Examination of the mother and the condition of the uterus in these cases has seemed to us to call for prompt delivery, the nervous prostration from which the patient suffers yielding promptly to strychnia, alcohol, digitalis, and external heat. Manual compression of the uterus, with massage, with hot intra-uterine douche, followed by a light tampon of iodoform gauze, have been sufficient in our hands to prevent the occurrence of post-partum hemorrhage. Opium seems to us indicated only when exhaustion comes on before the rupture of the membranes. Under the title of "Obstructed Labor" the author calls attention to tonic contraction of the uterus, and urges the necessity of immediate delivery. The diagnosis between uterine inertia and tonic contraction of the uterus is again emphasized by putting the symptoms of the two in direct contrast in tabulated form. No mention is made in this connection of symphysiotomy for the purpose of overcoming an obstruction to labor caused by moderate disproportion between the head and the pelvis.

The author defines a contracted pelvis as a pelvis which alters the course of labor. This definition certainly could be applied to a justo-major pelvis in view of the abnormal presentations and precipitate labors which are sometimes observed in pelves of this kind. The common forms of abnormal pelves are described and illustrated. The generally contracted or justo-minor pelvis is said to be very difficult of diagnosis, and is usually only discovered by difficulty in labor. If external pelvimetry and palpation be employed, this form of pelvis we believe will be readily diagnosticated before the beginning of labor. In describing the results of labor in contracted pelves, various injuries to the head and body of the child are described, together with the risks which the mother runs in these cases. In diagnosticating size and proportions of the pelvis the posterior interspinous measurements are held to be of importance by reason of their relations to the anterior measurements. Johnson's method of pelvimetry by the introduction of the entire hand is illustrated.

The mechanism of labor in the flat pelvis and the small round pelvis is clearly given in parallel columns, the treatment of flat pelves being version, while in the small round pelvis the use of forceps is advised. In dividing contracted pelves for the treatment of labor the writer indicates that it is possible for a living child to pass through the pelvis whose

antero-posterior diameter is at least three inches. While this may be in many cases true, we believe that many infant lives are lost by the endeavor to extract children from pelves whose antero-posterior diameter is three inches without enlarging the pelvis, by placing the patient in Walcher's position, or by performing symphysiotomy. In choosing the time for the induction of labor the author properly urges that labor be brought on at once when the head cannot be readily pressed into the brim. In treating of the choice of operation in contracted pelves, when the patient is at term, the author gives us to understand that the life of the child is not to be considered unless the parents especially desire its preservation. We believe that this is scarcely the impression which the author means to convey, and yet he mentions craniotomy and Cæsarean section in such a way as to give us this inference. For artificially dilating the os and cervix he especially prefers the water-bag of De Ribes. In stating the indications for immediate craniotomy, he again gives us the impression that Cæsarean section is not to be taken into account, for he would immediately perforate in cases where the conjugate diameter is less than three inches and the patient is at term, the head not engaging. In choosing the forceps he would apply them when the long diameter of the head is transverse, the anterior fontanelle as low as the posterior, the antero-posterior diameter of the pelvis being three inches or more. No mention is made of any effort to cause the head to descend by suprapubic pressure, by Walcher's position, or by placing the patient upon a suitable chair. We have been most successful with symphysiotomy in two cases of just this nature.

In comparing the forceps and version it is stated that forceps delivery may need hard pulling, but that is the only difficulty about it. In our observation, hard pulling with forceps is seldom resorted to without some complication resulting to mother or child. The ease with which turning can be performed depends considerably upon the anæsthetic employed and the operator's dexterity. Its advantages are well stated by the author. In treating of labor in a small round pelvis, when impaction occurs the author would apply forceps, and pull. If the fœtal heart cannot be heard, the head should be perforated at once. The author would perforate when he had failed to deliver by forceps by efforts extending at intervals during an hour. The rarer forms of contracted pelvis are fully illustrated by the text and pictures.

In treating of delayed labor through failure in dilatation of the soft parts, the author has found ten grains of antipyrin every two hours very useful. In treating of labor complicated by tumors it is stated that fibroids predispose to post-partum hemorrhage. Under the head of "Rupture of the Uterus" the author defines the lower uterine segment as the part corresponding to the line of firm attachment of the peritoneum. In treating this complication suture of the rent is advised when the rupture is complete; when incomplete, drainage, preferably by gauze, has given good results. Rupture of the perineum is to be treated by immediate suture with chromicized catgut. Accidental hemorrhage and post-partum hemorrhage receive adequate treatment. In placenta prævia we have seen excellent results in tamponing the os, cervix, and vagina with antiseptic gauze, which we should much prefer to using tents. Post-partum hemorrhage is thoroughly treated. We are glad to note the author's disapproval of the use of perchloride of iron within the uterus. Dührssen's treatment of post-partum hemorrhage by intra-

uterine tampon of gauze does not receive indorsement. The author urges especially compressing the uterus between one hand in the vagina and the other above the pubes. In treating of transfusion, intravenous transfusion is well illustrated. We have not found it necessary to open a vein in a patient, but simply to inject saline fluid into the connective-tissue spaces.

The forceps receives adequate illustration. We do not favor pendulum movements with the forceps, but prefer axis-traction, often with the assistance of tapes. Internal version and embryotomy are fully described and well illustrated. The book closes with a description of Cæsarean section, of the Porro operation, and symphysiotomy. In Cæsarean section we do not find hysterectomy after the extraction of the child advised, although it remains in a large number of cases the best operation. The author describes symphysiotomy, but gives a guarded opinion concerning its value. He seems especially uncertain as to the permanent results of the operation as regards the pelvis. Our experience and the condition of two patients under observation a year after symphysiotomy lead us to believe that the pelvis is permanently uninjured by the operation.

The reader will find this book an interesting and pleasant volume. The wide experience of the author has given him ample material from which to draw his conclusions. Some of his methods of treatment are not the ones commonly used by those who practise obstetric surgery in America at the present time, but this does not militate against the interest which the book excites in the reader. We commend the book to the reading of physicians and all interested in the study of obstetrics

E. P. D.

DISEASES OF THE EAR: A TEXT-BOOK FOR PRACTITIONERS AND STUDENTS OF MEDICINE. By EDWARD BRADFORD DENCH, Ph.B., M.D., Professor of Diseases of the Ear in the Bellevue Medical College, etc., New York. With eight colored plates and one hundred and fifty-two illustrations. 645 pp. New York: D. Appleton & Co.

THIS books seems to us cumbersome and far too large for the purpose for which it has been prepared, viz., for the instruction and direction of "practitioners and students of medicine." The little these busy men can learn of otology, and the little they can do themselves for the ear, can be set forth in a book of two or three hundred pages. These large treatises on the ear generally narrate what specialists have done or are doing for aural maladies. Hundreds of pages in such books can have no possible interest for the general practitioner nor for the student of medicine. They can be understood and criticised only by aurists purely on their otological merits or demerits.

The anatomical portion of this book, with its beautiful plates, leaves nothing to be desired; it would be hard to find more elegant and instructive plates than those running from I.–IV. But after leaving the chapters on anatomy, at page 48, we are launched into six hundred dreary, wordy pages, which contain little good advice, few good illustrations, and much antiquated and erroneous direction regarding the treatment of aural diseases. In the treatment of boils in the ear, for

example, only the employment of a local germicide, like a solution of menthol, carbolic acid, or ichthyol, will do any good. The early incision recommended by the author will not only increase the irritation and pain, but make a furrow for the implantation and growth of pathogenic germs. Incisions, like poultices and leeching, in furunculosis of the external ear, belong to the age of septic surgery. Certainly the modern otologist will not agree with the author in resorting to the use of the catheter before trying Politzer's air-bag for inflation of the tympana in tubal catarrh, nor in any other condition demanding inflation of the tympanum, and no aurist who understands his handicraft will employ cocainization of the nares before inserting the Eustachian catheter. Such preparation is not necessary; for if the surgeon knows how to catheterize the Eustachian tube, he will not hurt the patient. If the Eustachian catheter cannot be inserted without force and pain to the patient, it should not be inserted at all. In fact, both Politzer inflation and catheterization of the Eustachian tube are not needed so frequently as was once supposed, because of the now well-known danger of forcing septic matter into the drum-cavities by their employment, especially in acute processes in the naso-pharynx and middle ear. There is much more likelihood of their doing harm at such times than good. In fact, the catheter should never be employed in acute catarrhal processes in the naso-pharynx and middle ear, and Politzer's method only exceptionally, and then with the greatest gentleness and caution. And even in chronic catarrhal otitis media, where they find their chief application, both must be employed gently, especially the catheter, for fear of wounding the delicate structures of the nares. To cocainize the nares and then wound them would deprive the surgeon of the valuable information that he is hurting his patient and rendering him liable to all the bad consequences of a lesion in these parts.

The knowledge of bacteriology has revolutionized our ideas of treatment of especially acute diseases of the ear. We should be careful, therefore, in acute otitis media, which we know is due to the presence of a pathogenic germ in the middle ear, where it has gone from the naso-pharynx, not to throw fresh germs into the drum-cavity by any form of inflation of the simultaneously inflamed and septic nares. Spray these parts with a mild antiseptic solution; *apply no leeches*, for they cannot draw septic matter from the drum-cavity; apply *dry* heat over and about the outer ear, or, possibly, if the ear can endure such a burden, drop into it ten drops of a warm watery solution (1.5 to 2 per cent.) of carbolic acid. So much the general practitioner can do toward aborting the process or hastening spontaneous rupture of the membrana tympani, and no more. If the pain continues for six to twelve hours, or if it grows worse, without spontaneous rupture, especially in children, the membrana must be incised freely and an escape offered to the pent-up and generally inspissated exudation. This operation no general practitioner is able to perform unless he has specially learned it before he begins his general practice. Then, why waste time by trying to tell him in a book how to do it? After paracentesis of the membrana, or after its spontaneous rupture and the setting-in of a discharge from the ear, the ear should be let alone. The most that should be done is to insert a thin strip of iodoform- or carbolic-acid gauze pretty well into the auditory canal, but not against the membrana, lay a little tuft of the same gauze or iodoform- or boric-acid cotton in the concha, and let the organ

alone for twelve to twenty-four hours, according to the quantity of discharge in the meatus and concha. This discharge marks the escape of pathogenic elements from the drum-cavity, and should not be interfered with. Nor should the risk of secondary infection be run by syringing or blowing medicaments of any kind into the external meatus in acute otitis media; and instruction to do these things is most surprising, as found in the pages of this book, the latest aspirant to guide the general practitioner in the knowledge and treatment of ear diseases. He should be told what *not* to do in acute diseases of the middle ear, and that in chronic ear diseases, both catarrhal and purulent, he can do little or nothing.

It is not surprising that after ending his directions for treatment of acute otitis media the author turns to the consideration of acute mastoid disease. We have never known acute mastoid disease to follow acute otitis media when the latter has been promptly and properly treated. In every case of acute otitis media purulenta it is probable that pus is also in the mastoid antrum. But when there is a perforation in the membrana and a current of exudation has begun to flow outward a siphonic action takes place from the mastoid region, tending to empty the latter of its pus, if the siphonic outflow is not impeded by improper treatment of the ear. Such treatment, by setting up secondary irritation and infection in the membrana and drum-cavity, puts a stop to the outflow of pus, and may lead to mastoid complications.

We cannot, therefore, too strongly condemn the suggestion to employ a middle-ear syringe (p. 334) for washing out and medicating the drum-cavity in the last stages of an acute otitis media. It is meddlesome and infectious aural surgery, as we have often observed.

Chronic catarrhal otitis media is well described, and the usual means of treatment set forth. But the general practitioner can do little or nothing toward carrying out such treatment as is indicated in this disease. The author now stands alone in recommending (p. 512) total excision of the membrana tympani and the two larger ossicula for the relief of the symptoms of catarrhal otitis media. This operation is invariably followed by more or less inflammatory reaction, and the patient is worse in consequence of it. The stapes can be liberated and mobilized without resorting to such violence to the conductors of sound, either by removal of the incus or by simple passive motion with a probe after tympanotomy. General anæsthesia, however, is required for any operation on the middle ear, because cocainization will not produce enough local anæsthesia to keep the patient still, and furthermore cocainizing the drum-cavity is likely to produce not only acute otitis but toxic results, and it is to be regretted that the author favors such a method of local anæsthesia.

In chronic purulent otorrhœa removal of the remnants of the membrana and carious ossicles is indicated if ordinary antiseptic treatment has not checked or greatly diminished the quantity of the purulent discharge from the ear in the course of a year. If this operation were performed more frequently and promptly, there would be little need for mastoid operations. And in no instance should a mastoid operation simply for the cure of chronic otorrhœa be performed before excision of the remnants of the diseased membrana and ossicula has been effected. The latter operation, without resort to a mastoid incision and resection, will usually cure the chronic purulency, but a mastoid operation without

excision of the diseased conductors in the drum-cavity will not check the otorrhœa, as we have witnessed. In no case of chronic purulency in the drum-cavity should the stapes be removed, as its removal from the oval window offers an entrance to pus into the labyrinth and cranial cavity.

Much space is given to the consideration of operations on the mastoid, the sinuses of the brain, and even deeper cranial contents. A mastoid operation or any form of trepanation at this point is rarely demanded simply as a means of relief of an ear disease. When a mastoid operation is thus demanded, it should be directed toward the antrum by Stacke's method.

When a mastoid operation becomes a vital indication, there will also be found the concurrent necessity to penetrate still deeper within the cranium, and it therefore should never be undertaken at such a time by anyone unprepared to perform any profounder cranial operation which may be required.

The aurist's duty is to warn against the dangers of neglect of chronic otorrhœa and to clean out the septic matter from the suppurating drum-cavity, perfect drainage, and promote asepsis of this space. He will thus in numerous cases prevent mastoid necrosis, sinus-thrombosis, and cerebral abscess. If the two latter diseases arise, however, they fall almost entirely within the province of the general surgeon. It seems, therefore, out of place that these subjects should be discussed at length in a book on ear diseases and their treatment.

One is struck by the fact that this voluminous book has been written without any acknowledgment of the labors of American aurists in the fields of intratympanic and mastoid surgery. Want of space cannot be the excuse. In another edition we hope von Troeltsch's name will not be spelled "Troelsh" (pp. 85, 342, and in the Index), and that the tautological expression "Preliminary Preparations" (p. 465) will not appear. C. H. B.

HUMAN ANATOMY. A Complete Systematic Treatise by Various Authors. Edited by HENRY MORRIS, Esq., M.A., M.B. Lond., F.R.C.S., Surgeon and Lecturer on Surgery, formerly Lecturer on Anatomy, at the Middlesex Hospital; late Examiner in Anatomy in the University of Durham, and for the Royal College of Physicians on the Conjoint Board. Philadelphia: P. Blakiston, Son & Co.

THIS work is represented by a volume of 1286 8vo. pages by ten authors, illustrated with 791 woodcuts, 214 of which are printed in colors, from drawings made expressly for it. It is with pleasure that we note a new departure inaugurated in the presentation of a book of such excellence by ten authors, all of whom are eminent authorities on the subjects upon which they have written. "Osteology," by J. Bland Sutton, F.R.C.S.; "Joints," by the Editor, Henry Morris, F.R.C.S.; "Bloodvessels and Lymphatics," by William J. Walsham, F.R.C.S.; "Nervous System," by H. St. John Brooks, M.D.; "Eye," by R. Marcus Gunn, F.R.C.S.; "Tongue, Nose, Ear, Heart, Voice, Respiration," by Arthur Hensman, F.R.C.S.; "Organs of Digestion," by Frederick Treves, F.R.C.S.; "Urinary and Generative Organs," by

Wm. Anderson, F.R.C.S.; and "Surgical and Topographical Anatomy," by W. H. A. Jacobson, F.R.C.S.

The histology of tissues has very properly been omitted, except so far as is necessary in pointing out the modes and dates of development of bones, and in a few other instances.

It is a feature of great utility to the student to note that the origin of the muscles is marked in red and the insertion in blue lines, and the ligamentous attachments by dotted lines upon each bone. The general plan of the osteology is represented by the description, manner of articulation, attachment of muscles, blood-supply, and ossification, under distinct headings with heavy type. The text is clear, concise, devoid of combined term-descriptive words, which are so trying to the novitiate. In the illustrations, marginal notes with lines are used, instead of the old numbers with foot-note description. This is a great advantage, enabling the student to see at a glance the part described.

In the section on the joints we are brought by the editor upon familar ground, as his large work on the subject is constantly in memory before us. The outline is here classification, description of parts and ligaments, arterial supply, nerve-supply, and movements, indicated in large type.

In the part devoted to the muscular system, a short description is first given of the shape of each muscle, then follow in order its origin, insertion, structure, nerve-supply, action, and relations. These are all in large type and paragraphed. In smaller type are given after each muscle its variations. This description is of great assistance to the student, facilitating his ready reference to any point of interest. In the illustrations of this particular part, the system followed throughout the book of leading lines to marginal names is most noticeable, giving to each illustration perfect clearness and accuracy. It marks a long step in advance of the method of engraving names across the parts described, or the older plan of reference to numbers. The few pages added to this article by J. Bland Sutton, F.R.C.S., on "Abnormal Muscles," are of very great use to the student, giving in small space what he otherwise would look over many pages to find in other works.

It is very evident that the foregoing portions of the work have been reviewed by the various authors, as they give evidence of uniformity of action that is not so apparent in other parts.

The section devoted to the vascular system is remarkable for its clearness of description and the selection and beauty of its illustrations, many of the drawings being repeated to avoid the labor of turning back for reference. The colors have been well selected and the drawings finely executed. In the nervous system more colors might have been used to advantage in illustrating, particularly peripheral distribution. The article on the eye is most handsomely illustrated in several colors, and accurate in the details of its text. The same might be said of the ear, but there should be a revision of the French measurements, not only here but in other parts of the work, as some inaccuracies have occurred. The tongue and nasal cavities are well illustrated and tersely described, but the dimensions of the nares, either at the vertical, horizontal, upper or lower parts, are not given. This would have been, from a surgical point of view, of great value.

The article on the "Thoracic Viscera" is fully illustrated and written in a manner which will meet with favor. The description of the pharynx could with benefit be enlarged and more profusely illustrated.

The article on the "Digestive Organs" will bear some revision, but special praise must be given to the article on the peritoneum, for the author has given to the student that which has been long wanted. A clear understanding of this important part of human anatomy has been to students a stumbling-block of long standing. It is with satisfaction that we find here a description so clear that the most obtuse cannot fail to understand it.

The section on the urinary and generative organs, with some few exceptions, is well written and carefully illustrated, and we note with pleasure that the drawings assume the natural rather than the diagrammatic outlines; the vagina being no longer represented as a cylinder, but as it is found in the body. One of the exceptions noted is the position of Alcock's canal, which is stated as being "one inch above the inner margin of the tuber ischii;" this we think is too high. The section on surgical anatomy does not reach the high standard that we would wish. The illustrations are profuse, but it appears that the author has been cramped, and could have added much more, for hernia seems to have suffered very decidedly.

The index occupies sixty pages of the 1286, and has been prepared with great care, derivations being given in many instances with the names.

In reviewing the whole work, it may be said that the criticisms offered are small, but we have made use of the critic's privilege to point out all errors which we have noticed, as well as points of interest, which we believe possible to improve in a subsequent edition. The faults and errors, if they can be so called, are not such as would mislead a student. We therefore heartily recommend the work to beginners in human anatomy.

A. H.

LECTURES ON THE SURGICAL DISORDERS OF THE URINARY ORGANS. By REGINALD HARRISON, F.R.C.S. Fourth Edition, Rewritten. London: J. & A. Churchill.

THE surgeon who, on receipt of the fourth edition of Reginald Harrison's now classical work on *Surgical Disorders of the Urinary Organs*, slips this book into his satchel, with anticipations of the time required by his next railway trip to some neighboring town being profitably and delightfully spent, will be grievously disappointed on comfortably settling himself to his reading to find that with Continental disregard for time and convenience its publisher has provided in the uncut leaves a task which is well inclined to turn the kindly reviewer to a carping critic.

Once made accessible, however, this work will amply repay not only a general perusal, but a careful study. It has been very extensively re-edited and considerable enlarged, so that even those who are thoroughly familiar with former editions will find much that is new in this.

The importance of thorough irrigation in connection with the prevention of urethral stricture is strongly emphasized in the first lecture. Sulphocarbolate of zinc, 2 grains to the ounce, forced into the urethra by means of an irrigator, the nozzle of which fits tightly into the meatus, is the remedy of choice in the treatment of gleet, while deep urethral irrigation with a solution of perchloride of mercury is considered most

effective in shortening and moderating an attack of gonorrhœal orchitis.

The second lecture is devoted to the surgical anatomy of the urethra. This is brief, but very clear, and is considered solely from the clinical side. Thus, in speaking of the raphe, the statement is made that from extravasation or suppuration it may be pushed from one side to the other, or even slightly curved, but that the incision to open the perineum must correspond with such a deflection if the operator wishes to avoid troublesome hemorrhage.

While considering the nervous disorders of the genito-urinary organs, neurotomy of the spermatic cord is suggested as a means of curing neuralgia of the testis, some nerve-filaments from the sympathetic being teased out and resected. In one case cure was complete, nor was there any alteration in the nutrition of the testicle. In the passage of instruments the injection of a few drops of a 10 per cent. solution of cocaine is advised when patients complain of pain. Harrison states that the surgeon who boasts that he has never failed to pass an instrument into the bladder is to be regarded with some suspicion. The use of the olive-tipped bougie in the diagnosis of stricture is condemned, the flexible, slightly bulbous and conical bougie serving a better purpose when guided by the *tactus eruditus*. Gradual dilatation is advised for strictures of a recent date and those more advanced where the process is not intolerable to the patient, and the dilated condition may be maintained with a moderate amount of care. Continuous dilatation is advised for tight strictures where catheterism is attended with more than ordinary difficulty. Jordan's plan of introducing a bougie in place of a catheter is spoken of favorably, since thus there is a more rapid and complete dilatation of the stricture due to the hydrostatic pressure. This instrument is more readily introduced than a catheter, and need not be taken out. The continuous method not only favors absorption, but leaves the stricture in a condition less liable to contract.

Excision of the cicatricial mass is advised for traumatic strictures of the deep urethra. After excision the wound is closed over a full-sized bougie, the tissues covering the urethra being brought together in layers by catgut sutures and the skin treated in like manner. The wounds close by first intention, and in cases observed some months after operation there was no relapse. Electrolysis is condemned.

On the etiology of urinary fever no light is thrown, excepting that Harrison is inclined to believe rather in ptomaïne-poisoning than in the action of the micro-organism; indeed the bacterium coli commune, which now looms up as an important factor in this complication, is not mentioned. The remedies of choice are aconite and quinine, with boric acid as a prophylactic.

After urging the importance of careful and well-directed efforts to pass catheters in cases of retention of urine, the statements are made that with a fully distended bladder it is almost impossible to injure the peritoneum by suprapubic aspiration; that this method is practically painless; that it may be repeated almost indefinitely. This procedure is only to be advised when there is chance of restoring the patency of the urethra. When this chance is remote the urethra should be tapped at the apex of the prostate. The importance of strychnia, cantharides, and galvanism in restoring tone to the bladder is strongly insisted upon.

A special instrument of the author's device is described as best fitted

for internal urethrotomy. In this operation the value of the administration of antiseptics by the mouth is pointed out. For direct injection a solution of carbolized oil, 1 : 20, precedes the introduction of the instrument. After preliminary division of the stricture the author's instrument is introduced and the stricture is *divulsed* to full calibre. A full-sized catheter is then passed, the bladder is washed out with warm boric lotion, followed by bichloride of mercury, 1 : 6000, about an ounce of the latter solution being allowed to remain in the bladder. The fourth or fifth day a bougie is passed. After this, sounds are continued regularly. In the anterior urethra the Otis urethrotome is advised in certain strictures of large calibre, apparently full credence being given to the statement that hemorrhage is never severe and is easily controlled. Great importance is attached to the method of partly cutting and partly divulsing. Holt's operation of divulsion is praised, though most surgeons have long since ceased to employ it.

For drainage after perineal puncture, Harrison employs bougies with metal mounts, having openings on either side for retaining-tapes. These are about as thick as the index-finger; that is, they accurately fit the opening for which they are intended. This accurate fitting prevents hemorrhage. A soft-rubber tube is substituted in forty-eight hours. The question of drainage after this operation receives due consideration, and it is pointed out that this cannot possibly be efficient when the bed is of such a shape as to allow the patient to lie in a hollow. The buttocks should be elevated and the head of the bed raised.

After enunciating the commonly accepted doctrines as to the treatment of extravasation of urine, a case is cited in which twenty-four hours after this accident there was no sign of tissue-irritation. This was accounted for on the ground that there was almost complete absence of urea from the urine, and hence no ammoniacal decomposition. Brodie's dictum in regard to the sinister outlook when a black spot is seen on the enlarged glans penis is supported by two cases. The usual cause of extravasation in young male children is attributed to impaction of a calculus.

In the treatment of laceration of the urethra perineal section is advised, followed by union of the urethra by suture where this is possible. A case in point is quoted in which the patient recovered without stricture. Where a staff can be introduced this greatly simplifies operation. Where the urethra is completely torn across, the proximal end may be found by pressing over the pubis, and thus causing escape of urine.

Irritable bladder is referred to nervous erethism, habit, reflected action, structural disease, and abnormal states of the urine. Under this heading is considered that form of incontinence to which elderly persons are exposed, *i. e.*, the involuntary escape of drops of urine in connection with such movements as laughing. Tincture of cantharides in two- or three-drop doses three times a day and long continued is recommended for this.

The effect of frequent urination upon the ureters and pelvis of the kidneys is pointed out. In the treatment of bleeding from the bladder injections of hot water are advised.

Urinary tuberculosis is stated to be distinctly hereditary and to develop at the period of adolescence and vigorous manhood. The disease may travel downward from the kidneys or upward from the testes. When

it descends from the kidneys it is nearly always associated with hæmaturia, frequent micturition, and excess of or change in the ordinary mucus. In its earliest form as it attacks the kidney it is not infrequently found to be a cause of incontinence and urinary irritability in children. Where the disease is suspected the thermometer may prove of service in making a diagnosis. Cystotomy, when undertaken solely with the object of relieving the intense reflex irritation which often attends the deposit of tubercle in the urinary apparatus, is generally a failure. It is justifiable only when it is undertaken for the purpose of drainage. The treatment is that generally appropriate for tuberculosis: morphia for the relief of irritation, iodoform suspended in mucilage for irrigation of the bladder, and removal of the infected foci when they are accessible.

The prostate is regarded as a urinary rather than as a sexual organ, its muscular structure being considered of paramount importance. Follicular prostatitis is said to be common, and its symptoms closely simulate inflammation and suppuration around the membranous part of the urethra, and inflammation and plugging of the veins constituting the prostatic plexus. In the treatment of prostatitis leeches are advised, with copious injections of warm water into the bladder by means of a syringe and a soft-rubber catheter. Gouty prostatitis is discussed at length. One case of organic stricture of the prostate is reported, due to an injury by the sound.

In the treatment of enlarged prostates not much confidence is expressed in drugs. It is pointed out that a certain amount of residual urine is practically innocuous, provided that it is neither excessive nor deteriorated and irritating. Hence it is safe in certain of these cases to refrain from artificial aid. When there is distinct irritation the catheter is ordered, the bladder being emptied gradually when it has been overdistended, and the residuum cleansed with 1 : 10,000 bichloride, which is injected after each partial evacuation.

In the treatment of sudden retention of the urine by obstructing prostatitis Harrison holds that the long prostatic metal catheters are dangerous instruments and are seldom required, the English gum-elastic catheter, with hard stylet and made somewhat longer than usual, generally sufficing. When catheterism fails the aspirator may be introduced with impunity again and again. After the catheter has been passed in difficult cases it is best secured by a thread tied to it, and secured by adhesive plaster wound around the penis. It should be drained continuously into a urine bottle placed between the patient's thighs.

In dealing with advanced forms of prostatic obstruction, puncturing the prostate through the perineum is advised, one case of radical cure being reported from this operation.

After perineal prostatotomy large drainage-tubes are applied of such size as entirely to fill the wound and thus stop bleeding. The tube is retained for six to twelve weeks. It is then removed, when a sound can be introduced along the natural passages. The sound is passed until the perineal wound is healed. Harrison has operated by the perineal route in thirty-five cases, in eighteen of these through the floor of the prostate so divided, or a portion of it was removed before the drainage-tube was inserted. In the remainder the perineum was merely opened for the introduction of the tube and its retention in this position.

But three deaths immediately followed this operation. The percentage of permanent cures was extremely gratifying. The value of the suprapubic method in approaching the prostate is fully discussed. The preference is evidently given to the perineal route.

In the treatment of cystitis, blackberry tea prepared from the jelly, is recommended as an efficient and not disagreeable emulsent. Celery is commended for the relief of extreme irritability. Intravesical injection of a solution of morphia, made with a gum-elastic catheter, is said to be more efficacious in securing rest than rectal suppositories. Of the solutions employed in washing out the bladder in cases of chronic cystitis, carbolic acid, boroglyceride, and sulphocarbolate of soda are commended. Quinine-wash is especially indicated when the urine is purulent—two grains of the neutral sulphate to the ounce of distilled water. When, after cystitis, the urine remains alkaline, five to ten grains of citric acid in a pint of warm water should be given by injection. Bismuth is especially commended. Bichloride is said to be curative in the strength of 1:20,000 in certain cases of tubercular ulceration. For rupture of the bladder the drainage-incision should be that customarily made for lithotomy.

Some interesting experiments in regard to ocular inspection of the bladder through the perineal opening are detailed in a lecture on surgery of the kidneys and ureter. The chapters on urinary calculus are particularly full and precise, and are illustrated by many cases. Tumors of the bladder are somewhat hastily gone over. There is one lecture upon the treatment of varicocele and spermatorrhœa. The final lecture is devoted to malformations of the genital organs, to cystocele, circumcision, and hydrocele, a group which seems scarcely sufficiently related to be placed together.

It is not in a spirit of fault-finding that the reviewer closes this book with a feeling that though it is entertainingly written and clearly expressed, and represents the results gained in an enormous experience of the class of cases described, it is somewhat discursive, is too freely illustrated by cases, is not clear-cut in its opinions, and is not sufficiently detailed in its teachings to be of use to the student or general practitioner. Notwithstanding these defects, there is so much sound commonsense based on large experience that the book is simply invaluable to all who are working in this special line of surgery. It is worthy of note that credit has been most generously afforded to the work of American surgeons.

E. M.

METHODS OF OPERATING FOR CATARACT AND SECONDARY IMPAIRMENTS OF VISION, WITH THE RESULTS OF FIVE HUNDRED CASES. By SURGEON CAPTAIN G. H. FINK. London: J. & A. Churchill, 1894.

THE first part of this interesting brochure deals particularly with the methods of operating for cataract, and is based upon Captain Fink's extensive experience as an operator, more than a thousand extractions having occurred in his service in India. Five hundred of these are tabulated in the present work, 196 eyes having been treated by the double operation, with the following result: Success, 90.6 per cent.,

accidents and complications 6.6 per cent., loss by suppuration 2 8 per cent.

The knife is entered "at the junction of the upper with the middle third of the cornea, at the corneo-sclerotic junction;" and, after counter-puncture, is made to follow the curve of the cornea with as little see-saw motion as possible. The incision is finished at the upper extremity of the vertical axis of the cornea.

Captain Fink performs iridectomy with large nuclear and some striated and black cataracts, and when there is haziness and irritability around the edge of the cornea, leucoma, increased tension, or prolapse of the iris over the knife during its passage through the anterior chamber.

Fluid or soft cortical cataracts are extracted without capsulotomy, and the same method is pursued in exceptional cases with nuclear, striated and black cataracts. The advice is given to try to deliver the lens "without lacerating the capsule; and if it come away easily, well and good; if not, you prick it with the cystotome, and the immediate effect of this, if done according to Tweedy's method (laceration at the periphery), is to produce an increased dilatation of the pupil. . . ."

The remainder of this part of the book is taken up with a description of the accidents which may occur during cataract extraction, the after-treatment, and the tabular record of five hundred cases of cataract operated on by linear extraction with iridectomy, the results of which have previously been given. Captain Fink strictly attends to all proper antiseptic details.

The second portion of the brochure describes "laceration of the hyaloid membrane for secondary impairment of vision, after a successful operation for cataract had been undertaken." Captain Fink was led to this procedure by noticing that in a certain number of cases the patient was unable to see immediately after the performance of the most perfect cataract extraction, and that oblique illumination revealed the centre of the pupillary area occupied by a deep haziness which when touched by the cystotome at once gave way to a jet-black appearance, to be followed by the immediate restoration of vision. What has been accomplished under these circumstances is laceration of the hyaloid membrane, which, for reasons not always understood, has become opaque and deserves, according to Captain Fink, the name of "hyaloid cataract." He makes a sharp and very proper distinction between the posterior capsule and the hyaloid membrane. The immediate division of the former structure has several times been advocated, and recently by Dr. Fox, of this city; but Fink's operation appears to be reserved for special cases of opacity in the hyaloid, which have often been assigned, he thinks, "to the category of deep nervous or other mischief of the inner tissues of the eye." He urges this operation very strongly, and has no bad results to report.

Captain Fink seldom performs the secondary operation for cataract; and when pieces of cortex remain behind he has faith in the use of gray powder, Dover's powder, and iodide of potassium as absorbents, although he warns against the danger of conjunctival hyperæmia and ptyalism if they are used too freely.

This book will be read with interest by all those concerned with ophthalmic surgery as an acceptable account of an extended experience in the Indian medical service. G. DE S.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

Acute Gonorrhœal Rheumatism.

Dr. Howard Lilienthal has a preference for oil of wintergreen and sodium bicarbonate, with considerable attention to the alkalies, in the treatment of this disease. The diseased joint should at once be put at rest upon a splint of such proportions that as much comfort as possible may be obtained. Gentle compression over a dressing of ichthyol ointment twenty to fifty per cent., or over mercurial ointment, or over an ordinary wet dressing, should be applied by bandage. If the disease seems to be manageable, gentle massage is valuable during convalescence; but if ankylosis is inevitable, it should be assisted by perfect fixation in plaster-of-Paris. The indication is for forced feeding: meat, eggs, milk and its preparations, besides other simple and easily digested food, should be forced upon the patient every two hours or oftener, and accurate record should be kept of all nourishment taken.—*Boston Medical and Surgical Journal*, 1895, vol. cxxxii. p. 75.

Notes on the Newer Remedies.

Dr. David Cerna, in the second edition of his book of two hundred and fifty pages, presents an alphabetically arranged *résumé* of current literature concerning the newer acquisitions to materia medica. Although many of the drugs which are described in this work are already familiar to the readers of this department of The Journal and others are pharmacopœial and therefore are sufficiently well treated of in the text-books upon therapeutics, yet this volume is useful because one will find therein, in convenient form, many facts which would necessitate the search of a considerable portion of medical literature. While, in general, careful discrimination has been used to include only those remedies which have already proved their usefulness or give fair prospects of possessing valuable properties, it is quite likely that many will

be shown to be unsuccessful candidates for professional favor. The author is usually accurate, although in a book which is chiefly a compilation errors are liable to creep in. We would instance as one the dose of creosote carbonate (p. 80), and in this case the doses in the two systems do not agree. The book is convenient for reference, and is likely to be acceptable to the practising physician.

Aristol.

Dr. Heuse recommends the use of this remedy in powder-form for indolent corneal ulcerations with suppurating base. It is thickly applied with a brush and the eye kept closed for a little time. In two days the base of the ulcer becomes clean. In a five per cent. ointment it is useful in ulcerative blepharitis, being preferable to the ointment of yellow precipitate on account of its causing less irritation. This ointment has given good results in obstinate, recurring hordeola when rubbed into the edges of the lids at night.—*Therapeutische Monatshefte*, 1895, Heft 2, S. 85.

Salol in Non-parasitic Sycosis.

Dr. J. Abbott Cantrell reports three cases, certainly with curative effect in one, the others only benefited for a time. Twenty to forty grains to the ounce of petrolatum were employed.—*Therapeutic Gazette*, 1895, No. 2, p. 80.

Petrolatum Molle.

Mr. Lyman F. Kebler has examined nine samples, applying the tests of the *U. S. Pharmacopœia*. All but one was of a higher melting-point, four became opaque with sulphuric acid, one possessed a decided taste and odor. Contrary to what has recently been claimed, that this article is highly adulterated with fatty substances of both animal and vegetable origin, no chestnut-brown coloration was detected on treating with potassium permanganate, nor was any saponifiable matter found.—*American Journal of Pharmacy*, 1895, No. 3, p. 142.

[Although the common adulterations were not found, yet it should be noted that but one of the specimens, and that one not entirely, conformed to the official requirements.—R. W. W.]

Poisoning by Nutmegs.

Mr. T. G. Simpson reports that a strong, healthy woman, twenty-six years of age, being a week over her menstrual period, took two nutmegs, bruised, in a small quantity of gin. She was found lying upon the bed in a drowsy condition and very delirious, the delirium taking the form of confusion and mistaking one person for another. There were fairly lucid intervals. She complained of a sensation of great tightness across the chest, of vertigo, and faintness on attempting to stand. She had vomited several times. The pulse was 75 and rather feeble, as was also the heart's action. The pupils were normal. She was kept in bed, and strong coffee with a dessertspoonful

of brandy given every half-hour. A mixture of potassium bromide, ammonium carbonate, spirit of cajuput, and chloroform-water every four hours was prescribed. Convalescence was established on the second day following, but the nutmegs had no effect whatever in producing a miscarriage.—*The Lancet*, 1895, No. 3725, p. 150.

Asaprol in Pediatrics.

Dr. Moncorvo has found that in healthy infants this drug does not have any appreciable influence upon temperature, pulse, or respiration. No complaints have been made of its taste, nor has it given rise to any diarrhœa, cerebral manifestations, vertigo, or noises in the ears. In two cases, of small infants of very nervous temperament, it gave rise to an erythema, situated upon the body, and which disappeared two days after the discontinuance of the drug. It possesses analgesic properties. In many cases it increases the quantity of urine, notably in cases of malarial fever. If albuminuria exists, it does not seem to increase the amount in the urine. A property which has not been hitherto ascribed to the drug is that of checking hemorrhage, of which seven instances are cited. The remedy is given in from four to forty-five grains in the twenty-four hours, in sweetened water, to which is added syrup of tolu, gooseberries, or canella. For lotions or irrigations it is dissolved in water (1 to 5 to 100). For applications to the skin, nasal or pharyngeal mucous membrane it can be used with vaseline, to which may be added lanolin. In malarial fever this remedy is without doubt efficacious, lowering the temperature and modifying more or less rapidly the type of the fever. It lessens the malaise, nervousness, and insomnia, and the hepatic or splenic congestion. It sometimes gives rise to a profuse perspiration, but less than that excited by such drugs as antipyrin. In acute tuberculosis it seems incapable of efficiently acting as an antipyretic. In broncho-pneumonia the cases were too few for the expression of a decided opinion. In whooping-cough, when used as a application (1 to 100 of water) several times daily to the region about the glottis, relief almost without exception followed. As a topical application in cutaneous maladies and in diseases of the ear, nasal fossæ, throat, and valvo-vaginitis it is as useful an antiseptic as it is in the intestine. The morbid secretions stop, they become devoid of odor, and healing takes place.—*Bulletin Général de Thérapeutique*, 1895, 10e liv., p. 194; 12, p. 256; 14, p. 308; 16, p. 356.

The Treatment of Uric-acid Gravel.

Dr. Vaughan Harley states that the treatment takes two directions, according as we desire to increase the solubility or decrease the amount of uric acid formed. In the majority of cases uric-acid deposits are due to an increased tendency to precipitation, and not to excessive formation. In cases due to an increased tendency to precipitation drugs which help to hold uric acid in solution should be given. Piperazin has been found to be of service in those cases in which gravel has been due to diminished solvents and not to excessive formation, but it has no action whatever on the quantity of uric acid daily formed in the organism. In such cases it should be given with alkalies, as the alkaline waters or potassium bicarbonate, combined with the

iodides, and the alkalies should be given at bedtime. Here the diet is not of so much importance except in favor of salines and vegetables. If there is excessive formation, a carbohydrate diet is the most useful. Starch, sugar, and vegetables should, therefore, be the staple diet, and meat and fish in only small quantities. Sugar does not cause an increase of uric acid, but alcohol does, and therefore should be prohibited. Quinine and arsenic decrease the quantity of uric acid, because they diminish the quantity of leucocytes, and, therefore, in cases where gravel is due to excessive formation of uric acid they are most valuable. While moderate muscular exercise is of service, excessive exercise is harmful. In cases of excessive formation, although alkalies are of some assistance, they, like piperazin, are of only secondary importance by increasing the solubility of the uric acid formed.

Dr. Alexander Haig states that an arthritis can be produced when (1) there is a considerable excess of uric acid in the blood, in solution probably with some salt of potassium or sodium, and (2) there exists some condition unfavorable to solubility of uric acid so that it is precipitated in the joints. Mineral waters will often, as their first effect, precipitate an attack of gout because the first condition is present and the ingestion of the water brings about the second. But when this attack has passed over, and the absence of the urates continues, and from the use of the water there is a general stimulation of nutrition and metabolism throughout the body, and the blood is kept clear of urates for a considerable time, the gout is said to be cured. A meat-diet, if it is well digested, and if the patient is young enough to have his nutrition stimulated by it, will produce an absence of urates from the blood, and so long as it continues to do so there will be no arthritis. An excess of uric acid is being introduced, but it does not remain in the blood because the conditions are unfavorable to its solubility. Hence a meat-diet may prevent rather than produce an arthritis. Unfortunately, however, some patients are too old, others are already too feeble and wasted to respond to any stimulus, and others may at first respond to the stimulus of meat-diet, and later, from old age or other causes, fail to do so, and then their blood will become a good solvent of uric acid, and the urate which they have been previously introducing in meat-diet, or retaining with drug or mineral waters, will come through their blood and produce all the worst effects of severe uric acidæmia. For this reason the other way out of the difficulty is decidedly the better of the two; that is, to prevent the production of an excess of urates in the blood by diminishing the intake and formation of uric acid.—*British Medical Journal*, 1894, No. 1786, p. 637.

Dr. Benoit du Martouret presents an argument for the use of baths of dry vapor of fresh pine-shavings from the species Mugho. The results claimed are the active elimination of uric acid, which takes place from the elective action upon the kidneys which the balsam possesses. The phenomena of increased oxidation appear to be due to cinnamic and benzoic acids, which by their combination under the form of hippuric acid prevent the formation of uric acid. It is also claimed that the elimination of uric acid by these baths is greater than by the mineral-water treatment, and that it can be a specific in the diseases of the kidneys.—*Bulletin Général de Thérapeutique*, 1895, 16e liv., p. 347.

The Treatment of Typhoid Fever.

Dr. W. Gordon M. Byers reports twenty-two cases treated by Yeo's mixture. This mixture is practically a solution of chlorine, generated from potassium chlorate and strong hydrochloric acid in water, to which are added quinine and syrup of orange-peel. In addition a calomel or other purge is given in the initial stage of the fever, if diarrhœa does not exist; the large intestine is washed out twice daily with naphtholated water; feeding is carried on so that there is no bulky residue; an intestinal antiseptic is administered at the same time as the food. Antipyretics are objected to, but phenacetin in five-grain doses may be used. Tea and coffee, as cardiac stimulants, have been too much neglected, the general tendency being to give alcoholic stimulants too early and in too large quantities. In the cases reported, the washing of the large intestine was not carried out, antipyretics were not used, and stimulation by alcohol was found to be necessary in eight of the cases. As results, it was noted that the lips and tongue remained moist and the gums free from sordes, perhaps attributable to the careful cleansing by the nurses. The effect upon the alimentary excretion was very marked; in the great majority of cases the odor was much diminished, and in not a few cases there was absolutely no odor, although in a limited number the stools seemed to be unaffected by treatment, but in only one instance could the odor of chlorine be detected. Although three of the patients had well-marked hemorrhages, perforation was the cause of death in but one of the two fatal cases, and this patient did not enter until the twenty-second day of the disease. So far as the course of the fever was concerned, the results varied greatly: in some instances there was a sustained depression of the febrile temperature, in others the fever ran its cycle quite uninfluenced by the treatment. In certain cases, seen early, the duration of the fever seemed to be shortened. But few signs of "febrile intoxication" presented themselves; the mind in the great majority of cases was clear and bright throughout the entire course of the disease; the patients for the most part rested quietly during the day and slept well at night. Nor did the cases present that degree of emaciation and pallor which is present late in the disease, some retaining their color all through and comparing more than favorably with cases under the bath treatment in the same ward. Although it was commonly remarked, and in special cases seemed very apparent, it would be difficult to show certainly that these patients convalesced more rapidly than others under different treatment.—*Montreal Medical Journal*, 1895, No. 10, p. 721.

The Treatment of Cardiac Disease.

Dr. William C. Krauss believes that in strychnine we have an ideal cardiac stimulant, which not only acts upon the circulation, but as well upon respiration, digestion, and assimilation. It is especially indicated in the weak heart of pneumonia and febrile processes, given hypodermatically in $\frac{1}{30}$ to $\frac{1}{10}$ grain doses, repeated until some sign of the drug is manifested. It is also useful to relieve the alarming symptoms which occur in surgical anæsthesia, in the cardiac weakness often associated with neurasthenia, and in that due to depressed nerve-force. Strophanthus is of great value as a

cardiac sedative in that form of tachycardia so common in exophthalmic goitre. These two drugs will retain their supremacy because of their influence over the vital centres in the medulla, to which the various systems of the body look for support and encouragement.—*Therapeutic Gazette*, 1895, No. 5, p. 293.

The Treatment of Chlorosis.

Dr. G. Hayem prescribes rest, regulates the diet, and makes use of iron. Rest in bed is of the greatest importance and should be absolute in severe cases. This rest opposes the destruction of the red blood-corpuscles and checks a waste of iron, which is not compensated for by that absorbed. For this reason the patients are more easily cured in the hospitals than at home. Besides, rest in bed relieves the neurasthenia, calms the nervous irritability, regulates the digestive processes, and in abolishing the corset removes a frequent cause for dyspepsia. When patients again go about they should wear a flexible and elastic corset. Before prescribing iron it is necessary to relieve the dyspepsia. At first a milk-diet and underdone meat, later eggs and fish and green vegetables in soup and stewed fruits, may be added. Bread should be allowed only at the end of four or five weeks. Iron, either as the carbonate (Blaud's pills) or the oxalate, should be given at the beginning of the meal and hydrochloric acid a half-hour afterward.—*Journal des Praticiens*, 1895, No. 17, p. 265.

The Treatment of Malarial Hæmaturia.

Drs. H. A. Hare and Wilmer Krusen present the results of a collective investigation, based upon one hundred and seven replies to questions which were sent out, the area covered being that having a death-rate from malaria of 70 per cent. or over. Thirty-two remedies were used: the first six were calomel, tincture of ferric chloride, arsenic, ergot, turpentine, and sodium hyposulphite, each remedy being used by ten or more physicians. Calomel is used in from 5 to 50-grain doses and seems to be most in favor. Tincture of ferric chloride is used either alone or combined with arsenious acid or small doses of quinine. Arsenic is recommended in from 1 to 5-drop doses (Fowler's solution), the only caution stated is that the urine shall be clear. Sodium hyposulphite may be given in from 20 to 40 grains every three hours after thorough purgation with calomel. Ergot is regarded as a hæmostatic. Turpentine, in capsule, ten drops every three hours until the urine clears, and a turpentine liniment in the lumbar region, may arrest renal hemorrhage.—*Therapeutic Gazette*, 1895, No. 5, p. 291.

Anti-tubercle Serum.

Dr. Paul Paquin believes that tuberculosis in the stage of lesions, particularly when pulmonary cavities, intestinal ulcers, or other such alterations exist, becomes a mixed infection, due to the introduction of various other pathogenic microbes, besides the bacillus of tuberculosis in the specific wound. The serum is prepared from horses which have been rendered more strongly refractory to the action of the bacillus of tuberculosis than they are

normally. To obtain this immunity proper toxines are used. The treatment is begun with the subcutaneous injection of ten drops in the back between the shoulder-blades. In a few days the dose is increased to twenty, and then by ten drops to sixty drops once a day. In a few instances one hundred and fifty drops have been injected every day for several days. No reaction follows, and the pain is no greater than after the usual injection of morphine. Horse blood-serum in its natural state is feebly antagonistic to the germs of tuberculosis, being too slow and requiring enormous quantities, but it can be made strongly antagonistic to these germs by proper treatment. If a horse is properly treated, three months may yield serum with immunizing power which will probably prove sufficient to arrest consumption in the first stages in three or four months and sometimes in less time, and in the second stage in four to six months.—*St. Louis Medical and Surgical Journal*, 1895, No. 651, p. 137.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM OSLER, M.D.,
PROFESSOR OF MEDICINE IN THE JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND;
AND
GEORGE DOCK, M.D.,
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF MICHIGAN.

A Unique Case of Hydatids of the Liver.

At a recent meeting of the Medical Society of Victoria Ryan (*Australian Medical Journal*, vol. xvi., No. 11, p. 513) reported the case of a youth, seventeen years old, who presented enlargement of the liver, with distinct bulging in the region of the gall-bladder. There were also loss of flesh, jaundice, constipation, with clay-like stools, and discolored urine. In view of the gravity of the condition an exploratory operation was contemplated. As a preparatory step the patient was first purged and a large quantity of bile was passed in the stools, and with it a number of hydatid cysts as large as grapes. The patient at once improved and operative interference was for the time abstained from.

Some four months later symptoms similar to those previously present began to appear. Operation was again recommended, but, in view of the results obtained on a former occasion by free purgation, this was again resorted to, but found to exercise no beneficial effect. Accordingly, celiotomy was undertaken, the abdomen being opened by a vertical incision four inches long, some distance to the right of the abdominal line and over the most prominent part of the swelling. A portion of the anterior surface of the liver presented in the wound and appeared uniformly smooth and free from bulging or prominence. Careful exploration of the upper and lower surfaces of the liver and the adjacent regions was made with the hand, but no abnormality

could be detected. The sides of the wound having been carefully packed with sponges, several exploratory punctures were made in the surface of the liver with a long trocar, but without result. The organ was then incised to the extent of two inches, the incision being gradually deepened, but without exposing any morbid condition. There was free bleeding, which was controlled without difficulty by means of pressure with the fingers and with sponges.

The second case occurred in a man, twenty-five years old, who was suffering with an attack of specific urethritis, which was followed by swelling of the knee-joints and ankle-joints. There was complaint of pain, not only in the affected joints, but also in the præcordium. On physical examination the area of cardiac percussion-dulness was found to be normal, but a faint blowing-murmur was hear over the aorta, and at the apex a rough murmur that was transmitted to the back. Under treatment with sodium salicylate and the application of cold the symptoms soon improved, so that in the course of six weeks the right extremity presented a normal appearance, while the left remained swollen, and so continued for a considerable time after the patient was able to be out of bed.

Additional exploratory punctures were made into the liver by means of a long trocar, some through the abdominal wound and others through the intercostal spaces, but neither hydatid fluid nor pus was withdrawn from any part.

The question of incising the gall-bladder and attaching it externally was considered, but the procedure was found to be impossible on account of the great depth at which the organ was situated. The operation was concluded by washing out the abdominal cavity, and suturing with carbolized silk the incision in the liver to the sides of the abdominal wall.

About a week after the operation a few more cysts were passed by the bowel; the general condition had improved, the jaundice was less marked, the urine lighter in color, and the stools less clay-like in appearance. The abdominal wound was less distended, and there was some reduction in the size of the liver. There was almost entire freedom from pain, with an absence of vomiting, and a sufficient amount of nourishment was readily taken.

At the end of a month the patient was able to sit up. For ten days after the operation the abdominal wound was free from suppuration. Subsequently a small amount of pus was always present. The drainage-tube was kept in place for two weeks, but only for a few days was there any discharge of bile through it.

Despite the temporary improvement and the large amount of nourishment taken, the patient steadily lost flesh and strength, and died of exhaustion six weeks after the operation. Upon post-mortem examination the liver was found adherent to the abdominal wall about the wound, as well as to the stomach, and to be greatly enlarged, weighing six and one-quarter pounds. On section it was found to be riddled with abscesses. The gall-bladder was shrunken, the cystic duct being occluded with cretaceous-looking matter, supposed to be cholesterin. The remaining viscera, as well as portions of the tissues, were examined, but no hydatids were found.

It is believed that the sequence of events was as follows: Hydatids of

the liver with suppuration; the formation of adhesions between the liver and the colon, through an opening in which (which escaped observation post mortem) the cysts escaped. It is further suggested that the multiple abscesses may have been due to the numerous exploratory punctures made at the time of operation.

Bilateral Facial Palsy in the Sequence of Influenza.

Barkes (*Lancet*, No. 3726, p. 217) has reported the case of a medical man, thirty-six years old, who resided in a district which was extremely cold and bleak in winter, and whose brother and father had had attacks of facial palsy. Several weeks after an attack of influenza, at a time when the weather had become extremely severe, the man noticed paralysis of the muscles supplied by the facial nerve, first upon the left side and a day later upon the right. For two days before the paralysis appeared an absence of taste was noticed, but this may have been due to the condition of the surface of the tongue. Sensibility was everywhere preserved. The facial nerves were tender on pressure at their point of exit. Under energetic treatment, improvement speedily set in and progressed to ultimate recovery.

The Preparation of the Antitoxin of Diphtheria.

With a view to shortening the time required for the preparation of the antitoxin of diphtheria by any of the methods thus far employed, Klein (*Lancet*, No. 3720, p. 1415) makes a few injections of living diphtheria-bacilli attenuated by age, together with their toxin. The animal treated is thus furnished with a certain degree of resistance. Next, large quantities of living diphtheria-bacilli (minus their toxin), taken from the surface of solid cultures of gradually increasing virulence, are repeatedly injected subcutaneously, so as to allow the bacilli to grow and multiply and gradually to produce within the body of the animal the toxin, and ultimately the antitoxin. Each injection is followed by a temporary reaction, a rise of temperature varying between 0.6° and 1.8° C., and a local tumor; but there is no suppuration at the site of inoculation. As soon as one such tumor has disappeared a new injection is made with large quantities of living bacilli scraped from the surface of solid media (agar and gelatin). By the third week the animal will bear the scrapings fr om the surface of two whole agar-cultures of virulent character. In the case of one horse, antitoxic serum was obtained by this method in twenty-three days, and in that of another in twenty-six days from the date of the initial injection. If after the first bleeding the horse be again twice or thrice injected with virulent living diphtheria-bacilli (taken from surface-cultures), the further serum obtained will be found to possess increased antitoxic power.

Apyretic Typhoid Fever.

The designation apyretic typhoid fever ought to he reserved for cases in which the temperature remains normal or below throughout the course of the attack, in the absence of collapses, although there may be transitory elevation as a result of complication. All other symptoms may be present as

in a typical case of typhoid fever. Should the temperature rise to 100.4° F. during the first two or three hours, it later oscillates between 97.2° in the morning and 99.5° in the evening, without other variation not due to complication. The pulse is variable; sometimes it is slow, more often it is normal; occasionally it is increased in frequency. It is difficult to recognize the different stages of the disease, as these are usually indicated by the course of the temperature-curve. Convalescence is sometimes protracted, the patient remaining feeble and emaciated for a long time. The same complications may arise as occur in the ordinary course of the disease. Exceptionally, cases of typhoid fever occur in which the temperature is throughout subnormal. In these the temperature-curve is usually of the inverted type, the records being highest in the morning and lowest in the evening. From a diagnostic point of view importance is to be attached to the presence of enlargement of the spleen and of rose-spots. In explanation of these apyretic forms of typhoid fever it is assumed that elimination of the infectious elements of the disease by the kidneys is imperfectly effected, and recent experimental studies have shown that the urine of patients with typhoid fever at times contains toxic bodies capable of causing depression of temperature. It is suggested that in some cases there is a preponderance in the products of the activity of the typhoid bacillus of substances capable of causing such depression. Therapeutically, the absence of fever affords no special indication. Antipyretics—salicylic acid, quinine, antipyrin, thallin, etc.—have been found to cause elevation of temperature. Quinine seems to have been used to the best advantage.—*L'Abeille Médicale*, 1894, No. 50, p. 399.

The Pathological Anatomy of Diphtheritic Paralysis.

Preisz (*Deutsche Zeitschrift für Nervenheilkunde*, 1895, No. 6) describes the changes found in the spinal cord and the peripheral nerves in three cases of diphtheritic paralysis, two being general and one localized to the pharynx and heart. The first case showed atrophy of the ganglion-cells in the anterior horns, hemorrhage in the gray substance, and degeneration in various peripheral nerves and in the anterior and posterior roots of the cord. There were also peculiar changes in some of the peripheral nerves, which the author thinks identical with alterations described by Kopp in the peripheral nerves of dogs after extirpation of the thyroid, and by Langhans in cachexia thyreopriva in men and monkeys. It is not yet known whether these interfere with the functions of the nerves. In another case there was extensive degeneration of the posterior root in the lumbar cord and in the left column of Goll, and a slight degeneration of the right column of Goll in the cervical portion, secondary to a focus in the posterior roots of the cervical and upper dorsal cord. There was also atrophy of the ganglion-cells of the anterior horn. In the third case the vagi and glosso-pharyngeal nerves were extensively degenerated; the phrenics and the intermuscular nerve-trunks of the palatal and pharyngeal muscles were less severely affected. In this case death occurred on the seventeenth day after diphtheria. From these results it appears that in general post-diphtheritic paralysis the central and peripheral nerves are affected simultaneously. The ataxias noticed in such cases are explained by the changes in the posterior roots and columns.

A Gastric Equivalent of Migraine.

Bary (*Neurologisches Centralblatt*, 1895, No. 6, p. 251) reports a case which he thinks illustrates an "equivalent" of migraine in the sense of Liveing and Möbius, or a "nerve-storm" corresponding to an attack of migraine, but differing in its location. The patient was a woman, aged fifty-one years, with a family history of dementia and various neuroses. From her ninth year the patient had attacks of headache every three or four weeks, brought on by various irritations or spontaneously. The attacks varied in intensity up to the most severe, with the other symptoms of migraine. There was no aura. Suddenly, and without apparent cause, pain appeared in the epigastric region. It came on almost every day, sometimes several times in a day, lasting one or two hours and disappearing suddenly. Besides eructation at the end of the attacks there were no other symptoms on the part of the stomach or intestines. During three months, while this condition lasted, there was no headache, but after the epigastric pain suddenly stopped migraine again began. Two years later the headache again ceased for two months, and the epigastric pain reappeared for the same period. A son of the patient had mild attacks of migraine. As there was no evidence of stomach disease, or of hysteria or neurasthenia, and as the attacks alternated with those of migraine, the author thinks they can only be explained as above.

The Percentage of Iron in the Liver in Ankylostomiasis.

As the result of a series of analyses, Rake (*Journal of Pathology and Bacteriology*, vol. iii., No. 1, p. 107) found that in ankylostomiasis the average percentage of iron in the liver is less than in other diseases, and is very much less than the average percentage in pernicious anæmia. Thus, in ankylostomiasis it is 0.1 per cent.; in other diseases, 0.12 per cent.; and in pernicious anæmia, 0.7 per cent. The iron in the spleen is scarcely affected in ankylostomiasis; the intense anæmia associated with this condition is simply due to loss of blood from the intestine, and is not caused by any toxic blood-destruction in the liver.

Hysterical Syncope, Hemianæsthesia, and Rapid Breathing.

Burr (*University Medical Magazine*, vol. vii., No. 5, p. 334) has reported the case of a woman, forty years old, who, while submitting to an application of a 10 per cent. solution of cocaine to a sensitive tonsil, suddenly grew pale and lost consciousness, while the breathing became very shallow and the lips cyanosed. The heart was weak and fluttering, and the pulse scarcely perceptible. On subsequent examination it was found that the right arm and leg were perfectly analgesic, while the sense of pain was impaired, though not abolished, on the right side of the face. Common sensibility was also impaired in these same regions. Pressure upon the supraorbital and infraorbital notches and upon the seventh nerve on the right side of the face, and upon the great occipital nerve, was painful. The breathing was exceedingly rapid and shallow and of upper costal type, but regular. Its frequency varied between 48 and 60, and was subject to abrupt variations. An attempt

to study the fields of color-vision was attended with loss of consciousness which could also be induced by pressure upon one of the tender points already mentioned; breathing at the same time apparently ceased entirely. The patient proved exceedingly susceptible to hypnotism, but not at all to suggestion. Careful examination failed to disclose the existence of organic disease of whatever kind.

THE PIGMENTATION OF URIC-ACID CRYSTALS DEPOSITED FROM URINE.

GARROD (*Journal of Pathology and Bacteriology*, vol. iii., No. 1, p. 100) has found that of the true urinary pigments that exist ready formed in the urine, only the normal yellow pigment (urochrome) and uroerythrin appear to possess the property of coloring uric-acid crystals deposited from their solutions. The yellow pigment, being a constant constituent of the urine, always furnishes the ground-tint of the crystals, and plays the more important part in determining their form; the whetstone or canoe-shape being that which this substance specially tends to produce. In the majority of instances uric-acid crystals, which are spontaneously and rapidly deposited from urine, contain uroerythrin also, and it is to this pigment that the sediments owe their red color when seen in bulk. The various shades of orange and red observed in the individual crystals are due to the admixture, in varying relative proportions, of the two pigments named; and although crystals colored by the yellow pigment alone are sometimes met with, uroerythrin is never the sole coloring-matter of the natural sediments. The minute quantity of iron present in the sediments is not a constituent either of the yellow pigment or of uroerythrin. Other pigments occasionally present in urine, which have a share in the coloration of the crystals in some cases, are the brown products resulting from the action of mineral acids, the oxidation-products of phenol derivatives, and the pigments of the bile. Urobilin and hæmatoporphyrin take no part in the coloration of the crystals.

ULCERATIVE ENDOCARDITIS IN THE SEQUENCE OF SPECIFIC URETHRITIS.

WINTERBERG (*Festschrift zum 25. Jaehr. Jubilaeum des Vereins Deutscher Aerzte zu San Francisco*, 1894) has reported the case of a man, twenty-five years old, who, in the course of an attack of specific urethritis, complicated by right-sided epididymitis and enlargement of the glands in the groin, was seized with a chill, followed by fever and general malaise, together with swelling of both elbow-joints. Rest in bed, together with the administration of sodium salicylate, was at once prescribed, but improvement failed to ensue. Cyanosis and dyspnœa set in, and speech became difficult and the sensorium obscured. There was general dulness on percussion of the chest, and moist râles were heard on auscultation, together with loud, blowing systolic and diastolic murmurs over the heart, especially in the aortic and pulmonary areas. The knees and ankles also became slightly swollen. The liver and spleen were enlarged, and the stools contained blood and the urine albumin. Death took place amid the signs of exhaustion.

Upon post-mortem examination both pleural cavities were found to contain a large amount of serum, compressing the œdematous lungs. The pericardial sac contained rather more than three ounces of sero purulent fluid. The

heart was enlarged and the myocardium, which presented a grayish appearance, contained numerous purulent foci. The aortic and pulmonary leaflets were almost entirely absent, and replaced by friable caseous remains. The mitral and tricuspid leaflets presented similar changes, though not quite so advanced. The liver and spleen contained numerous small hemorrhages, and the kidneys had undergone amyloid degeneration. The small intestine was the seat of numerous ecchymoses. Peyer's patches were reddened and swollen, but free from ulceration. Microscopic examination of fragments of the cardiac valves disclosed the presence of gonococci.

Rupture of Aortic Aneurism into the Superior Vena Cava.

Bruce reports an interesting case of this somewhat rare condition in the *Edinburgh Medical Journal* for April, 1895. The patient was a male, aged fifty-seven years, a hard worker, with a previous history of alcoholism and lues.

He was admitted to the hospital with cough, cyanosis, and dyspnœa, the two latter symptoms having come on suddenly two days previously without any extra exertion on his part. On examination he was found to be cyanosed from the head down, the cyanosis ceasing at the attachment of the diaphragm in front and at the loins behind. The cyanosed area was œdematous, as were the upper extremities. The cyanosis of the face and right side of the thorax was particularly well marked, the left side of the thorax being free from lividity.

The abdomen and legs were neither œdematous nor cyanosed. Percussion of the chest showed extensive dulness from the clavicle down to the ensiform cartilage, and reaching laterally on either side from three to four inches outside of the mid-sternal line.

Auscultation over the base of the heart showed a peculiar murmur, continuous and swishing in character, and somewhat resembling a venous bruit. It was most intense during systole, and gradually died away during diastole, and was propagated best to the right of the sternum, having its greatest intensity over the sternum at the level of the third costal cartilage.

Seven days after admission the patient, who had remained in about the same condition, had a sudden attack of cyanosis, and the next day the maximum intensity of the murmur was noted to be opposite the second costal cartilage.

The patient gradually grew feebler and more cyanosed, and died eighteen days after admission.

The autopsy showed a large saccular dilatation of the aorta reaching from the valves to the origin of the innominate; on its right and posterior aspect were found two perforations about three-quarters of an inch apart.

Dr. Bruce inclined to the opinion that the sudden attack of dyspnœa, and the subsequent change in the position of the maximum intensity of the murmur, were due to a second perforation, as one of the openings seemed much fresher than the other. The condition is fully described in Pepper and Griffith's study of varicose aneurism of the aorta and vena cava (American Journal of the Medical Sciences, 1890).

Meningitis during Erysipelas.

Roger (*Revue de Médecine*, April, 1895), in an article on pneumococcus infections in erysipelas, points out that though we are apt to regard most of the infections secondary to this disease as secondary streptococcus localizations, they are really relatively frequently due to other organisms.

He reports three cases of meningitis occurring during the course of facial erysipelas, in all of which the pneumococcus was the predominating organism in the meningeal exudate, though in two cases the streptococcus was also present in small numbers. In all the cases there was lung-involvement also, one of the lower lobes being consolidated and the pneumococcus being found in cultures therefrom.

In speaking of the symptoms the author states that in two cases out of the three they were too slight for diagnostic purposes, consisting only of delirium and incontinence of urine and feces. One case showed the typical signs of meningitis.

Roger is inclined to regard these cases as auto-infections, as he has no evidence of extension by infection from other cases, and he calls attention to the fact that Netter has shown that virulent pneumococci can be isolated from the sputa of quite a large proportion of convalescent erysipelas cases.

A Case of Syringomyelia with Argyll-Robertson Pupil.

Lévi and Sauvineau (*Société de Biologie*, April 12, 1895) report an interesting case of syringomyelia in which the Argyll-Robertson pupil was one of the symptoms. The case presented the symptoms of muscular atrophy, changes in sensibility, and paralysis, with cutaneous trophic disturbances in the form of a bullous skin-eruption. Besides the ordinary signs of syringomyelia there were also present motor inco-ordination and loss of tactile sensibility. The authors leave the question open as to whether this is a simple syringomyelia or a syringomyelia combined with tabes, of which several cases have been reported.

The Argyll-Robertson pupil, they state, has never been observed so far in syringomyelia pure and simple.

Outside of tabes and general paresis, the Argyll-Robertson pupil has been observed unilaterally in hypertrophic cervical pachymeningitis, in cortical hemiopia, and in one case of high Pott's disease.

The authors do not pretend to locate the lesion causing the symptom in this particular case.

Pseudo-membranous Sore-throat due to Oïdium Albicans.

Tessier (*Archives de Médecine Expérimentale*, March, 1895) reports a case of pseudo-membranous angina in which the only organism present was the ordinary thrush fungus.

The disease occurred in a female, aged twenty-three years, who had been treated for secondary lues. The patient was taken suddenly with chill, slight fever, malaise, and anorexia. The next day she complained of sore-throat and pain on swallowing, and examination showed two white patches, which had not previously existed, on the anterior pillars of the fauces. The

membrane was in the form of a moderately thick pellicle similar to the eschar formed by cauterization with nitrate of silver.

Posterior to the patches, on the tonsils, mucous patches were to be observed on either side.

The membrane presented a certain amount of resistance, but was easily detached with a platinum needle, and on removal the surfaces presenting showed a similar appearance to the neighboring mucous patches.

Examination of both cover-slips and cultures showed the only organism present to be the oïdium albicans, which in the membrane itself lacked mycelium, but this developed on appropriate media.

The author concludes that the oïdium can be infective, and points out the fact that Grasset was able to produce suppuration by inoculating it subcutaneously into a rabbit.

The Coexistence of True Leucocythemia and Cancer.

Lannois and Regand (*Archives de Médecine Expérimentale*, March, 1895), after remarking on the rarity of the coincidence of these two diseases, record a new case. The patient was a female, aged fifty-eight years, who for the three preceding years had had some glandular enlargement, and for two years had had uterine symptoms.

Physical examination showed an epithelioma of the cervix uteri and very marked general glandular enlargement, accompanied by enlargement of the liver and spleen. Examination of the blood showed a proportion of one white to twenty-five red corpuscles, the white corpuscles being chiefly of the small mononuclear variety.

The patient gradually sank, and died with fever about six weeks after admission.

The autopsy showed general enlargement of the lymph-glands, with enlarged liver and spleen and carcinoma uteri. The histological examination of the glands showed simple hyperplasia and no signs of carcinoma; the liver and spleen showed the changes usually associated with leukæmia. The uterus showed carcinoma of the alveolar type. Bacteriological examination showed a general streptococcus infection, the organism having penetrated even into the lymph-glands, though the authors regard this as secondary, and do not claim any connection between the infection and the blood-changes.

Hydatid of Liver Infected with Pneumococcus.

Galliard (*Presse Médicale*, April 20, 1895) has reported the case of a man of fifty years, who entered hospital for symptoms of intestinal obstruction. He had violent pain in the right hypochondrium, the liver was enlarged, and the diagnosis of hepatic colic was made, as for two days he had had slight icterus with colorless stools.

The pain in the lower region gradually disappeared, the swelling still remaining, and high fever developed; puncture withdrew pus which was not bile-stained.

An incision later showed numerous hydatids and a pure culture of the pneumococcus in the fluid. The man gave no history of a previous pneumonia.

OTOLOGY.

UNDER THE CHARGE OF

CHARLES H. BURNETT, M.D.,

AURAL SURGEON, PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

Rupture of the Membrana Tympani from Violence.

Dr. William E. Hopkins, of the San Francisco Polyclinic, reports a case of the above-named nature, the accident being due to the foolish practice of striking the ear to dislodge water which may have entered during bathing. Such a self-inflicted slap over the auricle not only ruptured the membrane, but forced cold water from the auditory canal into the middle-ear, setting up violent otitis media, with pain and serous discharge (*Pacific Medical Journal*, San Francisco). In such a case it is contrary to the canons of aural surgery to instil anything into the ear. It is necessary only to stop the meatus with iodoform-gauze, and let it alone.

Aspergillus Flavescens in the Auditory Canal.

In a case of this disease, reported by Dr. O. D. Pomeroy, of New York (*American Medico-Surgical Bulletin*), it is shown that strong solutions of nitrate of silver and even alcohol are insufficient to destroy the fungus. Instillations of liq. sodæ chlorinatæ, full strength, entirely destroyed the aspergillus in two days, with three daily instillations. We have never known insufflation of a powder composed of boric acid, 16 parts, and chinoline salicylate, 1 part, to fail to destroy aspergillus in the ear in one application.

Acute Otitis Media.

Only a few good articles on this subject have appeared during the past year. Chief among these is an article by Gradenigo and Pes (*Archiv f. Ohrenh.*, Band 38, S. 65). Nature shows us by the generally early spontaneous rupture of the membrana, in acute otitis media, in a previously healthy ear, what is best for the acutely inflamed drum-cavity, viz., the *escape* of the pathogenic micro-organism. Not only must this fact be kept in mind, but it must be remembered also that nature will further resent the entrance of fresh infectious germs from without. Therefore, not only should the exit of the pathogenic germs already in the middle-ear be promoted, but the surgeon should be careful *not to throw anything*, into the ear after either spontaneous or artificial perforation of the membrana tympani in acute otitis media. Most anything now put in the ear will be irritating or infectious. Even absorbent cotton twisted on the cotton-holder by the cleanest fingers is loaded with staphylococci, as is shown by Lermoyez and Helme (*Annales des Maladies de l'Oreille*, vol. xxi.), and may prove the source of secondary infection. It will be best to instil a few drops—10 at most—of a

warm solution of carbolic acid (1.5 per cent. to 2 per cent.), or a solution of bichloride of mercury (1:10,000), into the auditory canal of the acutely inflamed ear before rupture or paracentesis occurs. After spontaneous rupture or artificial paracentesis a short, narrow strip of iodoform-gauze (1 in. by ½ in.) should be inserted into the canal nearly as far as the membrana, the concha then gently filled with iodoform-gauze or iodoform-cotton, and the ear let alone for at least twenty-four hours. Then the same kind of dressings should go on again. This favors the escape of pathogenic organisms, generally the streptococcus albus, and prevents the entrance of staphylococci and secondary infection. Any other treatment, especially one calling for syringing anything into the ear, will be very likely to provoke a secondary infection of the drum-cavity. It is cases treated in this septic manner which lead to instances of so-called acute mastoiditis, with other bad results. It is very much to be regretted that the treatment of the acutely inflamed ear in many cases has been far worse than no treatment. In many instances either the patient or his physician has ignorantly brought about secondary infection of the middle-ear and mastoid cavity by putting things in the ear instead of, in acute cases, favoring drainage, as just stated, by a filament of iodoform-gauze, or, in fact, letting the ear alone and permitting it to run. We cannot commend too highly the rational treatment marked out by Gradenigo and Pes in their article, from which we have condensed the above.

Inflammation of the Middle-ear of Infants.

Hartmann and Kossel give the following results of their investigations on this subject, made in the Berlin Institute of Infectious Diseases (*Deutsche med. Wochenschrift*, No. 26, 1894):

1. Post-mortem examination and the examination of the ears of living children in this institution establish the fact that 75 per cent. suffer from inflammation of the middle-ear.

2. Inflammation of the middle-ear in infants can nearly always be detected by an otoscopic examination.

3. The general symptoms of otitis media are restlessness, elevated temperature, and loss of weight. Sometimes these symptoms are not present.

4. Very often the symptoms of otitis media are connected with bronchopneumonic processes. Probably both processes are due to the same cause—aspiration at birth.

5. Death can result in cases of otitis media, from slow atrophy or from an extension of the micro-organisms into the cranial cavity or into the blood.

6. The inflammations of the middle-ears of infants must receive treatment suitable for the varying conditions.

Caries of the Auditory Ossicles. Chronic Purulent Otitis Media. Radical Cure of Chronic Otorrhœa.

Chronic purulent otitis media is caused by the entrance of staphylococci into the middle-ear through the perforation in the membrana caused by the acute process. These pathogenic organisms are usually inserted by the physician or patient by improper treatment rather than by neglect, as shown

by LERMOYEZ and HELME (*Annales des Maladies de l' Oreille*, vol. xxi.). The chief result of the chronic inflammation is caries of the ossicles. The only cure for the malady when it reaches this stage is excision of the remnants of the diseased membrana and carious ossicula, as demonstrated by the reports of operations of Sexton, of New York, 1886, and other aural surgeons since then down to the recent good results of Mr. Hugh E. Jones, of Liverpool (*Liverpool Medico-Chirurgical Journal*, July, 1894); Beco, of Liége (*Annales des Mal. de l' Oreille*, vol. xx.); Dr. William Milligan (*British Med. Journal*, November 24, 1894); Grunert and Meier (*Archiv f. Ohrenh.*, vol. xxxviii.); Gleason, of Philadelphia (*Atlantic Medical Monthly*, March 25, 1895); and J. Orne Green, of Boston (*Boston City Hospital Medical and Surgical Reports*, 1895). The last named author operated in sixty cases, in which all other methods of treatment failed to check the discharge, which had lasted for from five to ten years. In many cases the discharge ceased absolutely; in others it was not entirely checked. Some cases were cured at first, but relapsed from poor hygiene. The hearing was much improved in many instances.

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

PROFESSOR OF DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA;

AND

MILTON B. HARTZELL, M.D.,

INSTRUCTOR IN DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA.

PECULIAR CUTANEOUS MANIFESTATIONS FROM QUININE.

C. W. ALLEN (*Medical Record*, January 26, 1895). The most frequent form of eruption resulting from quinine is probably the scarlatinoid, an erythematous rash, beginning usually on the face and subsequently extending over the whole surface. Other not uncommon forms are the urticarial and papular, while the vesicular, bullous, and purpuric are less frequently met with. Allen's case differed from the majority of those heretofore reported, in that the eruption occurred in a subject who had previously always been able to take quinine in moderately large doses, and had never before suffered in any way from its use; the smallness of the dose causing the eruption—one-quarter of a grain; the localization of the lesions, with no tendency to spread or to become generalized; in that the location of individual spots was always the same, no matter how large or small the dose; in that the eruption was produced four times accidentally and fourteen times experimentally; and, finally, in the fact that, varying the dose, the lesion, which was always primarily erythematous, became urticarial, œdematous, bullous, covered over with small vesicles, or converted into an excoriated patch. A

woodcut illustrates the form, size, and distribution of the lesions, and the general pathology of the manifestation is fully considered.

The Protozoa-like Bodies of Herpes Zoster.

In a short paper read before the American Dermatological Association (*Journal of Cutaneous and Genito-Urinary Diseases*, September, 1894) Hartzell calls attention to and describes certain peculiar bodies found in the vesicles of herpes zoster, which Pfeiffer regards as protozoa and the cause of the disease. The author found these bodies not only in the ordinary forms of zoster, but also in a case of traumatic zoster in which there had been many recurrences for a period of years. He does not regard them as protozoa, but forms of cell-degeneration.

The Etiology of Pemphigus.

Dumesnil reports (*Archiv für Dermatologie und Syphilis*, Band xxx., Heft 2) in detail the histories of five cases of pemphigus, and from his observation of these and other cases he is led to the conclusion that the affection is dependent upon an anomaly of function of the nervous system, which is partly acquired and partly congenital. The author calls attention to the fact that pemphigus often recurs after strong psychic disturbance; and that the hysterical and those whose nervous system has suffered in its powers of resistance through chronic alcoholism or other toxic influence furnish a large contingent of pemphigus cases.

Eleidin.

Dreysel and Oppler, in a study of this substance as found in normal and pathologically changed skin (*Archiv für Dermatologie und Syphilis*, Band xxx. Heft 1), formulate the following conclusions:

1. Eleidin is a viscid substance found everywhere in the stratum lucidum of the human skin, in the borders of the hair-follicles, and in those parts of the excretory ducts of the sweat-glands which pass through the horny layer, in the shape of fine drops and larger accumulations. In the mucous membranes eleidin is found only in those parts adjoining the skin, and there only in small quantities.

2. Brief hardening in alcohol has no essential influence upon the tingibility and consistence of the eleidin. Its demonstration in alcohol-hardened skin is very simple. Staining succeeds best in picro-carmine and sulpho-acid nigrosin. The eleidin is fixed in a certain measure through staining, and shows after this an increased resistance to certain chemical influences.

3. The amount of the eleidin in the epidermis is not always proportional to that of the kerato-hyalin; in normal skin it is, in general, dependent upon the thickness of the horny layer, and is, therefore, greatest in the soles of the feet and tips of the fingers.

4. From numerous examinations of pathologically changed skin it can be concluded that in pure hyperkeratoses an increase of the eleidin, as of kerato-hyalin, is present. In diseases which accompany anomalies of cornification-parakeratoses the eleidin more completely and earlier disappears than

the kerato-hyalin, and has never been found when the nuclei in the stratum corneum have retained their tingibility, although kerato-hyalin may be demonstrated in such places.

In molluscum contagiosum the eleidin, as well as the kerato-hyalin, is greatly increased.

A Case of Papillary and Pigmentary Dystrophy (Acanthosis Nigricans).

Darier reports (*Annales de Dermatologie et de Syphilographie*, 1895, No. 2) a new case of this interesting and rare disease. The patient was an officer, thirty years of age, and while not exactly cachectic, he was perceptibly emaciated and pale. When examined nude one noticed a brownish discoloration of certain regions of the skin, particularly of the neck, the articular folds, and the epigastric region. Besides this abnormal pigmentation there was a verrucous or papillomatous condition of the skin in the same localities and in some non-pigmented places. There were also multiple papillomata and numerous nævi. The cutaneous affection had developed during the course of a grave chronic dyspepsia, which was probably connected with a gastric neoplasm. From this case and others previously observed the author concludes:

1. Papillary and pigmentary dystrophy (acanthosis nigricans) is a legitimate and well-defined morbid type, a regional and symmetric dermatosis, affecting from its beginning precise and constant localizations, and characterized by papillary hypertrophy and abnormal pigmentation.

2. This dystrophy seems to develop always secondarily to a gastric or abdominal carcinosis without one being able to say at the present time what is the physiological mechanism by which it is produced. It should be placed among the dermatoses which depend upon internal maladies.

A Puncture with a Bone of a Living Fish in the West Indies, followed by Leprosy, in a Caucasian Subject.

Ashmead reports (*Journal of the American Medical Association*, March 16, 1895) the case of a man, aged thirty-five years, who received a wound from the fin of a fish in Cuban waters, which was followed immediately by great swelling of the arm, lasting a week. Immediately afterward an eruption appeared on the front of the chest, the head, and the face, consisting of watery vesicles, which broke and formed large scabs. When the eruption had disappeared, after some months, red blotches remained on the nose and forehead, the latter situated symmetrically over the eyebrows. These blotches gradually thickened and became nodulated. This condition continued to increase, the ears becoming tuberculated. Soon after the first appearance of the blotches the patient discovered numbness on the ulnar side of the forearm; this was followed in time by numbness in the feet. At the present time the patient presents all the clinical features of leprosy; and sections made of an excised tubercle from the third finger of the left hand showed an abundance of the bacillus lepræ and leprosy cells. There is no history of leprosy in any preceding generation, and his children and grandchild are healthy.

Case Illustrating the Neurotic Origin of Hydrocystoma.

Mr. Jonathan Hutchinson reports (*British Journal of Dermatology*, May, 1895) a case of hydrocystoma in which the cysts were much more abundant on the right side than on the left. The patient, a woman, sixty-four years of age, was presented at his clinical demonstrations as an example of unilateral sweating, the sweating occurring upon the right side. In early life the patient had suffered much from severe headaches, which were much worse on the right side. Later she had neuralgia of the tongue, also more severe on the right side. Mr. Hutchinson believes that the life-long liability to hemicrania has had something to do with the disturbance in the skin.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,
PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC; CLINICAL PROFESSOR OF OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE; CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE; VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,
INSTRUCTOR IN OBSTETRICS IN THE PHILADELPHIA POLYCLINIC.

The Obstetrical Society of London and the Midwives Question

In his inaugural address as President, Champneys urged the duty of medical men to provide properly educated midwives for attendance upon the poor. He considered the first duty of the profession to be to the sick, and, inasmuch as poor women will employ midwives when they cannot obtain physicians, it is the duty of the profession to educate properly women capable of conducting normal cases.

This action of the President of the London Obstetrical Society is of interest, in view of the fact that the same problem presents itself to American medical men for solution. Among the foreign poor of American cities midwives practise extensively, and the American profession must sooner or later recognize this fact, and take action in the interest of the poor.

Myomectomy during Pregnancy.

Leopold contributes an article under this title in the *American Journal of Obstetrics*, May, 1895, in which he describes the case of a multigravida, pregnant, her condition being complicated by a hard, round tumor on the left side above the pubis. On making an abdominal incision a calcified myoma in the anterior uterine wall was found, freely movable, extending

deeply into the muscular layers of the uterus. The capsule was incised transversely, the tumor removed, and its bed tamponed with iodoform-gauze. The bed of the tumor was obliterated by twenty-six deep and superficial catgut sutures. The peritoneal flaps were shortened and united by fine sutures. The patient made a perfect convalescence and went to term, being delivered spontaneously.

Respiration in the Newborn.

Dohrn, from a series of examinations made upon newborn children to determine the extent to which respiration is carried, has found that on the average, during the first ten days of life, a child respires fifty times to the minute. There seems to be no difference between prematurely born children and those at term, or between boys and girls, in the frequency of breathing. During crying an infant inspires less frequently than during regular breathing. Inspiration and expiration during crying vary from forty-seven to sixty-two to the minute. The average movement in expiratory respiration during the first ten days of life is forty-five cubic centimetres. The amount of air changed in respiration is the same in children of both sexes, but is less in prematurely born children. The depth of respiratory movements increases from the first to the tenth day of life, so that the expiratory movements during the last few days of the ten are increased twelve cubic centimetres. The reason for this increase is found in the enlarged play of the ribs, the dilatation of the bronchial tubes, and the increased respiratory necessity of the child. The depth of respiratory movements is less in the newborn than one would expect. It is evident that the first respiratory movements do not unfold the lungs, but that this process is a very gradual one.—*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxxii. Heft 1.

Endometritis during Pregnancy.

Emanuel and Wittkowsky (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxxii. Heft 1) have made examination of the lining membrane of the uterus in cases of pregnancy complicated by endometritis, and conclude that this condition results from a previous chronic endometritis which becomes acute upon the supervention of pregnancy.

Veit agrees with this conclusion, and calls attention to cases of myxoma of the chorion in which the decidua contains micro-organisms. He does not believe, however, that the ovum is infected and infects the mother; but, on the contrary, that myxoma of the chorion is usually caused by endometritis which has existed prior to conception.

Extra-uterine Gestation.

A series of interesting cases is reported from the Odessa Hospital by Thomson (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxxii. Heft 1). In the first of these cases the ovum died at six months, and began to be discharged by ulceration into the vagina. Incision and extraction of the ovum with its appendages were followed by cure. In a second case, in the last month of pregnancy, the ovum opened the abdominal wall by ulceration,

causing in the process a fistula into the large intestine, which was subsequently closed by operation. Case III. was tubal gestation upon the right side, which recovered after operation. Case IV. was an extra-uterine gestation upon the left side in the tube, in which the ovum perished, and was gradually absorbed, the patient recovering without interference. In the last case of the series a tubal pregnancy upon the right side had ulcerated into the vagina, causing a partial stricture. From his experience Thomson concludes that one is not justified in waiting when, after rupture, a hæmatocele increases, or when the sac of the ovum becomes smaller and harder without the formation of a hæmatocele. When the fœtal sac ruptures between the layers of the broad ligament the circumstances are favorable for spontaneous recovery.

The Experience of the Clinic Baudelocque in Symphysiotomy during the Year 1894.

Although many of these cases have been formerly reported in the *Annales de Gynécologie*, for January, 1895, Pinard, in an interesting reprint, summarizes his experience of the past year. In his clinical practice he has ceased to induce labor. He has abandoned forceps applications which require the forcible delivery of the head through the bony pelvis above the pelvic cavity, or inferior strait. He has entirely abandoned embryotomy upon the living child. In place of these operations he proposes enlarging the pelvis by severing the symphysis, or some other portion of the bony pelvis, in all cases where uterine contractions do not overcome the resistance of the bony pelvis, and where pelvimetry shows that there is reason to believe that after the pelvis is opened its diameters will be sufficiently large to permit the extraction of a child at term. Where, however, after section of the pelvis sufficient will not be gained to permit the birth of a living child, he believes in practising abdominal incision, the extraction of the child by incision into the uterus, followed by hysterectomy, with the removal of the tubes and ovaries. There were twenty-two symphysiotomies at the clinic: nine done by Pinard, five by Varnier, six by Wallich, and two by Saint-Blaise. Thirteen of these patients were primiparæ, nine multigravidæ. In seventeen the child presented by the vertex, twice by the breech, once by the shoulder, once a brow presentation, and once a face presentation. In twenty cases the pelvis was rhachitic. In one, rhachitic with a congenital luxation of the femur, and in one case there was spondylolisthesis. One patient had symphysiotomy performed for the second time. Among these mothers there were three deaths; one from intestinal obstruction, caused by a fibrous band. Two patients died of sepsis who had been in labor some time before admission, and had been infected with sepsis before going into the clinic. None of these cases was complicated by hemorrhage. Although on several occasions slight injury to the anterior vaginal wall occurred at the moment of delivery, these injuries were not serious, and are easily avoided by dilating the vagina thoroughly with the De Ribes's elastic bag before symphysiotomy is performed. Pinard also hastened dilatation of the cervix in several cases by performing symphysiotomy early in labor, and thus bringing the head against the cervix to complete its opening. No after-complications were observed in these cases, the patients regaining their health and power to work.

Tonic Muscular Contraction in the Fœtus in a Case of Eclampsia.

Dohrn reports (*Centralblatt für Gynäkologie*, 1895, No. 19) a very interesting case of a patient in fatal eclampsia, in whom the os and cervix were so tightly closed that artificial dilatation was impossible. Accordingly, post-mortem Cæsarean section was practised immediately after death. It was found that the fœtus had perished, and apparently in a convulsion, as the jaws were tightly closed, the arms and legs bent, and the fingers drawn strongly into the palms. The child had but recently perished. So rigid were the muscles that it was necessary to open the uterus widely in order to extract the child. This persisted for sixteen hours after the delivery of the fœtus. Post-mortem examination upon the child showed extravasation of blood beneath the dura and in the arachnoid spaces over the left cerebral hemisphere.

Post-partum Hemorrhage.

In the *Medical Press and Circular*, 1895, No. 19, is published a clinical lecture by Schauta, of Vienna, upon "Post-partum Hemorrhage." He has observed that when the uterus is found after birth in the normal position and well contracted, if hemorrhage is present, it is usually from some laceration about the urethra, vagina, or cervix. Such tears are especially dangerous at the posterior extremity of the vagina, as large vessels leading to the cervix are thus opened. Small tumors of the uterus may have become torn during labor, thus producing hemorrhage. Such cases should be treated by thorough manual examination, followed by suture, removal of a small growth, or thorough tamponing with iodoform-gauze.

In avoiding the most usual cause of post-partum hemorrhage, namely, relaxation of the uterus, Schauta waits for half an hour to three hours for the spontaneous separation of the placenta. He encourages this by gentle friction, and would finally employ firm pressure if necessary. Should post-partum hemorrhage supervene, he would rub the uterus vigorously, use a hot douche, and pack the uterus with iodoform-gauze, leaving it twenty-four hours. If the uterine vessels are atheromatous, hysterectomy may be indicated. He has found the injection of saline fluid beneath the skin of great value in these cases.

The Temperature and Mortality-rate in Newborn Children dependent upon Umbilical Infection.

In the *Centralblatt für Gnyäkologie*, No. 1895, 17, Hermes reviews recent papers upon the subject, and describes the method of care employed in the Dantzig clinic, which is as follows: The cord is tied with fine linen-tape, soaked in a 3 per cent. carbolic acid solution, four fingers' breadth from the umbilicus. Precautions are taken to disinfect the nurse's hands before tying the cord. The stump of the cord is dressed in cotton and smeared with 4 per cent. carbolized vaseline, retained in place by a linen bandage. The dressing of the cord is changed daily after the bath, and the same dressing is placed upon the umbilicus after the cord separates until it is completely

healed. The cotton used is carefully sterilized and kept in glass jars. Hermes' observations upon 100 children show that, with strict cleanliness, the child's temperature did not rise to 38° C. In only two of his cases was this temperature observed, and in these immediately after the separation of the cord, when the umbilicus secreted more abundantly than usual. Among his cases were two in which infection of the umbilicus occurred. In most of his cases the cord separated on the fifth day after the birth.

The Diagnosis of Fœtal Position by External Examination.

Benttner (*Correspondenz Blatt für Schweizer Aerzte*, 1895, No. 10), in practising diagnosis by external manipulation, has found of especial value a method which consists in palpating the head with the two hands of the examiner. In one manipulation both hands are turned with their backs toward the abdominal surface of the mother, and firm but gentle pressure is made to distinguish the child's neck, the hands being placed beneath the chin and occiput. By the other manipulation the hands are turned in the same way, but one hand is pressed deeply behind the pubic joint, the palmar surface turned toward the pubis, while the other hand, with its dorsum toward the abdominal wall of the mother, presses in the sulcus between the head and the trunk.

A Research upon Respiration in the Newborn, and Methods of Resuscitation.

In the *Berliner klinische Wochenschrift*, 1895, No. 17, Zuntz and Strassmann describe a series of investigations made upon respiration in the newborn with the aid of the manometer. The results of their studies are in favor of those methods of resuscitation which mechanically force air into the chest. They speak with especial stress of inflation of the lungs performed by the introduction of a soft catheter into the trachea.

Eclampsia and its Causation.

Schreiber contributes from the obstetrical clinic at Odessa an interesting paper upon eclampsia, with the report of four cases (*Monatsschrift für Geburtshülfe und Gynäkologie*, 1895, Band i. Heft v.). By a review of the literature of the subject, he draws attention to the fact that the causation of eclampsia must be sought in a process which attacks not only the kidneys, but other eliminative organs of the body. Of his four cases, three recovered under the use of the hot pack and inhalations of chloroform, with injections of morphine and rapid delivery. His fourth case died, and the post-mortem examination showed enlarged liver with degenerated liver-substance and cerebral anæmia as the only pathological conditions present.

The Toxic Element in Eclamptic Cases.

A most interesting research in the pathogenesis of eclampsia has been made by Ludwig and Savor, assistants in Chrobak's clinic in Vienna.

They report in the *Monatsschrift für Geburtshülfe und Gynäkologie*, 1895, Band i. Heft v., the results of their investigations concerning the toxicity of the urine and the blood-serum of eclamptic patients. They observed by experiments upon animals that the toxicity of the urine in these patients varies greatly from time to time. Contrary to what might be expected, during convulsions the toxicity of the urine is much less than at other times, while, on the contrary, the poisonous properties of the blood-serum of these cases increases markedly during the time of convulsions. These results were obtained by injecting into animals the urine and blood-serum from eclamptic cases.

These interesting investigations point clearly to the fact that retained toxins are the cause of eclampsia. They certainly point most strongly to the great indication for treatment in these cases, namely, the prompt promotion of elimination in every possible way.

Two Cases of Ectopic Tubal Gestation Treated by Vaginal Cœliotomy.

In the *Centralblatt für Gynäkologie*, 1895, No. 15, Dührssen reports two very interesting operations for tubal gestation. His plan of operation consists in opening the anterior wall of the vagina, separating the tissue between the vagina and bladder, drawing down the uterus to the vulva, ligating the broad ligaments with silkworm-gut, ligating the vessels with catgut, and removing tube or ovary, or exsecting small fibroid growths in the wall of the uterus. The incision in the vaginal wall is then closed by continuous catgut suture, and union is expected by first intention.

His first case was that of a multipara who had a tubal pregnancy upon the right side. A hæmatoma was present about the tube, and adhesions had formed. Under the plan of operation described the body of the uterus was pulled down, the affected tube and ovary removed, the adhesions broken up, and the pedicle or stump cauterized with the Paquelin cautery. Douglas's cul-de-sac was emptied of blood-clots, and a small myoma was removed from the posterior wall of the uterus and its former site cauterized. The uterus and left tube and ovary, which were found to be normal, were replaced, the deeper tissues closed with catgut, and the T-shaped incision in the vaginal wall closed with two continuous catgut sutures. Examination of the tube removed confirmed the diagnosis. The patient made an uneventful recovery, and a month later the remaining ovary was found movable, the uterus in normal anteversion, the right parametrium free from exudate, while the scar in the anterior vaginal wall resembled that of a successful anterior colporrhaphy.

His second case was that of a primigravida who suffered from tubal disease and tubal pregnancy upon the left side. By the method of operation described the gravid tube and ovary were removed, adhesions of the right tube were broken up and the tube removed, and the uterus was stitched to the anterior vaginal wall. The incisions in the vaginal wall were closed as before. This patient made a good recovery, and three weeks later the uterus was in normal position, while upon the left side a slight and non-sensitive thickening was found. Dührssen commends this form of operation in cases where the

pregnancy is not advanced more than three months, because the shock is less than from abdominal cœliotomy, while the result is equally and, possibly, more satisfactory. The operation is more difficult than abdominal cœliotomy.

Puerperal Albuminuria and Convulsions.

Sir John Williams (*Practitioner*, January, 1895) contributes an interesting paper in which he draws attention to the fact that renal disease is not the sole cause of puerperal eclampsia. The points which sustain this opinion in his mind are that convulsions may occur in the absence of albumin in the urine; that in many fatal cases of eclamptic convulsions disease of the kidneys is absent or insignificant; and that puerperal convulsions are comparatively rare in persons the subjects of chronic Bright's disease prior to the occurrence of pregnancy. Williams describes two cases of convulsions, associated with albuminuria, in which the albuminuria was not the whole of the disease nor the whole of the condition giving rise to the convulsions. His first case was that of a primigravida who had jaundice, increased liver-dulness and tenderness, without œdema of the face, legs, hands, or feet. The urine contained albumin, bile, granular casts, urates, and leucin. Blindness and epileptiform convulsions occurred. The uterus was dilated, and a dead fœtus expelled. The patient speedily recovered. About a year later she became pregnant again, and suffered greatly from sternal pain, with a dusky, bloated face, and albuminuria. Labor was again induced, and a six-months fœtus delivered. The urine contained urates, phosphates, mucus, and hyaline casts. A third pregnancy subsequently occurred, and the patient was kept under close observation. Albumin appeared, accompanied with a dusky, bloated face; this was relieved by bleeding. She continued to have attacks of bloating with scanty secretion of urine, sternal pain, and hard, small pulse. Labor was again induced, followed by recovery. A subsequent pregnancy went on successfully until the sixth month, when the patient was kept in bed, and her urine examined twice daily. Early in the ninth month albumin developed, the amount increasing steadily until confinement. After confinement her symptoms speedily passed away. The case was seen in consultation by Jenner and Matthews Duncan, the latter considering it a case of acute yellow atrophy of the liver. An analysis of her symptoms confirmed the belief that the cause of her condition was an irritant poison giving rise to severe arterial tension and albuminuria.

This view is borne out by the second case reported by Williams, which proved fatal. The patient was a primipara at the end of gestation. She had blindness, vomiting, and eclamptic fits, with stertorous breathing. She was slightly jaundiced, with very slight œdema of the ankles and eyelids. The pulse was small and hard. The liver-dulness extended to two fingers' breadth below the margin of the chest. The urine was the color of porter. The pupils were small and equal. Under chloroform and chloral labor was induced, and bleeding was practised. The patient died undelivered. The amount of urea excreted varied from $1\frac{4}{10}$ per cent. to $\frac{85}{100}$ per cent. Tryosin and leucin were present; bile-pigment, bile-acids, and blood-casts were also present. On post-mortem examination, eight hours after death, the integument of the child was found to be peeling. On microscopic examination of

the liver the cells were found to be greatly altered, in many places vacuolated. The spleen was enlarged, the kidneys slightly so, their cortical substance presenting numerous small spaces. The cells of the kidney were many of them degenerated. Granular casts were found in the tubules in the medullary portions.

The pathology of the condition is that of a severe contamination of the blood, resulting in damage to the organs of excretion. The disease is far more complicated than Bright's disease.

Schultze's Method of Resuscitation in Children with Broken Clavicles.

Keilmann (*Centralblatt für Gynäkologie*, 1895, No. 3) reports two cases of difficult extraction, in which a clavicle of the child was broken, and in which it was necessary to practise Schultze's method of resuscitation. In both cases the children recovered, and union occurred without deformity.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,
OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,
OF PHILADELPHIA.

Persistence of Bacilli in Children Cured of Diphtheria.

Sevestre and Méry, in a communication to the Société médicale des Hôpitaux (*Revue mensuelle des Maladies de l'Enfance*, March, 1895), detail their studies at the Hôpital Trousseau upon this most important point. After quoting the observations of Loeffler, Roux and Yersin, Tobiesen, Tezenas, and Boureau, which, while agreeing in the main fact, differ greatly in the proportion of negative and positive results and in the degree of virulence observed in the latter class of cases, the authors proceed to contrast their observations in two distinct series of cases. The first class included those cases treated from June to December, 1873, by the methods then in vogue (repeated lavage, applications of local antiseptics); while the second series embraced the cases from December, 1894, treated by injections of antitoxin serum.

The first series numbered fifteen children in which the cultures of throat or of tracheal mucus had been positive and virulent, and the treatment had consisted of topical applications (Gaucher's liquid, and oftener the stérésol of Berlioz) and nasal and pharyngeal irrigations every two or three hours with solution of carbolic acid 1 to 100. After disappearance of the membrane

these irrigations were continued twice daily till the patients were discharged. The later cultures, after disappearance of false membrane, had given variable results: four times bacilli were not present after repeated examinations; twice they had persisted, but had lost their virulence; while once there was a single positive result after several examinations. In four cases virulent germs were found for a period of six to fifteen days after disappearance of membrane; in two cases the cultures from the throat were negative, but those from the nose showed the presence of bacilli, which in one case persisted for forty-nine days after removal of the tracheotomy-tube and thirty-eight days after leaving the hospital. In other words, in about half the cases the bacillus had disappeared at the same time as the membranes, or had, at least, ceased to be virulent; but in the other cases had continued for some time after the subsidence of active symptoms of the disease.

The second series of cases, which were treated by antitoxin, had had no local treatment but irrigations of Labarraque's solution (50 to 1000), and included ten cases. In three the results were negative after repeated examinations for one, two, or three weeks. In four cases cultures showed non-virulent bacilli, generally the short variety, although the long or medium bacillus had been present at the onset of the disease. Finally, in three cases a virulent bacillus was found in several successive cultures. In one of these cases, after virulency was demonstrated for twelve days after cure, the short, non-virulent variety was found in the several examinations after this period, and persisted nearly a month after the patient's leaving the hospital. The instances in which the virulent bacillus continued present were especially the grave cases in which the convalescence had been retarded by diphtheritic paralysis or by accidents imputable to the injections (eruptions, arthropathies).

From the above it may be seen that in the two series of cases the results, as far as persistence of bacilli is concerned, are very nearly the same. In comparison with the observations of others, the following conclusions are drawn:

1. In a certain number of cases the bacillus of Loeffler disappears about the same time as the false membranes, or persists for a shorter or longer time, but ceases then to be virulent, taking usually the form of the short variety. This favorable result is realized in one-half to two-thirds of the cases, more especially in those of milder type.

2. In another series of cases, less numerous, but forming an imposing minority, the bacillus persists in a virulent state for some time after the apparent cure of the disease. It may continue in the throat, but more often and for a longer time it is found in the nasal fossæ. Irrigation of the throat and nose appears to limit the persistence of the bacillus, and is therefore indicated not only during the acute stage of the disease, but also after the disappearance of false membrane and during the convalescence.

Observations upon Temperature and Pulse after Injections of Diphtheria Antitoxin.

Variot (*Société médicale des Hôpitaux*, March 1, 1895) states that in most children, following an injection of the serum, there is a rise of temperature more or less marked: four hours after injection the thermometer shows $\frac{9}{10}°$ to $1\frac{4}{5}°$ F. higher than before; five to eight hours after, this has reached $1\frac{4}{5}°$ to $2\frac{7}{10}°$.

In some cases the temperature may rise from normal to 104°. At the end of two to three days the temperature returns to normal. As the temperature rises after injection the pulse becomes accelerated, reaching 140, 150, or 160, and may remain high after the rectal temperature has fallen to 99½°; but after three or four days it returns to the normal, though remaining feeble and small. There is sometimes arhythmia. The author has observed these modifications of pulse in more than one-half of the children treated by the serum. That these effects are due to the serum, not to the disease, is shown by the fact that they have been observed in cases where the antitoxin was used in healthy children as a prophylactic.

Thyroid-feeding in Cretinism.

Osler (*Archives of Pediatrics*, February, 1895) records the further history and progress of one of the cases reported by him in 1893. (See American Journal of the Medical Sciences, November, 1893.) When first seen by Osler, January 10, 1892, the child, a female, was two years and three months old. Well-marked symptoms of cretinism were present. As it was evident that the blood-condition was below par, she was ordered syrup of the iodide of iron. She was not seen again till March, 1893, when marked improvement was noted. She was then three and a half years old, her height being seventy-five cm. She looked more intelligent, took more notice, and the facial expression was decidedly brighter. She tried to say a few words, and had begun to walk with a little assistance. The most striking changes were in the disappearance, in great part, of the anæmia and lessening of the firm subcutaneous œdema which was previously so marked a feature.

Treatment with the thyroid extract was then begun, at first in the form of the glycerin extract in an amount corresponding to about a quarter of the gland in twenty-four hours. This she took during the summer and autumn, but later the desiccated gland was given in its place.

At the end of fourteen months, in April, 1894, the change was extraordinary, manifested, first, in entire loss of the cretinoid aspect, the color being good, and nutrition evidently much improved; second, she had begun to develop rapidly, and since the last measurements, fourteen months before, she had grown four inches in height; third, she walked and ran about everywhere; and, fourth, the mental development had been proportionately striking.

Another remarkable case showing the beneficial effects of thyroid-feeding has been recently reported by Dr. J. P. West, of Bellaire, Ohio (*Archives of Pediatrics*, May, 1895). The child was first seen at the age of seventeen months, when she weighed but fourteen and a half pounds and was twenty-three inches in height, presenting a characteristic picture of cretinism, as evidenced by the photograph taken at that time. After six months of thyroid treatment the changes were remarkable. According to the report, which is fully borne out by the photograph accompanying it, there was no evidence that would indicate that the child was a cretin except her height (twenty-seven and a half inches). The skin was soft and clear, the hair plentiful, soft, and silky, and the expression of the face bright and intelligent. The tongue was perfectly normal, and her mouth anything but repulsive. Eight teeth had been cut.

A comparison of the two photographs shows more significantly than any description the wonderful change that had taken place during six months of treatment. During this time she took about 300 doses of desiccated thyroid extract and two drachms of the glycerin extract, the former in doses of one grain twice a day, the latter in doses of one and one-half drop thrice daily. During the administration of the latter preparation the dose had to be occasionally diminished on account of feverishness and fretfulness.

LEBRETON (*Gazette médicale de Paris*, January 19, 1895) reports a case in a boy, aged three years, in which some interesting points concerning the blood-condition were observed. Before the treatment was begun examination of the blood showed 1,750,000 red corpuscles and 4500 white, while the hæmoglobin measured 65 per cent. Six weeks later, during the period of active treatment, the red cells numbered 2,450,000, the white 9,600, and the hæmoglobin had increased to 68 per cent. Dried specimens, at the first examination, showed that the red cells were larger than normal and that some nucleated red cells were present, but this was not observed at the later examination. The relative proportion of mononuclear to polynuclear leucocytes was at first below normal, while the lymphocytes were increased in number. At the later examination there was marked improvement in this respect. The presence of nucleated red corpuscles is attributed to the fact that in these cases the fœtal process of blood-formation persists.

TREATMENT OF CHOLERA INFANTUM.

BLECH (*New York Medical Journal*, March 2, 1895) strongly advocates intestinal irrigation and stomach-washing. For the latter he uses hydrozone in the proportion of a tablespoonful to the pint of water; for the former purpose he uses cold water, adding about two ounces of hydrozone to the quart. Vomiting usually ceases after the first washing, but this procedure may be repeated if necessary. Irrigation of the bowel can be repeated every two hours. Among the other drugs only two are to be employed—morphine and strychnine—to be given hypodermically. No antipyretics should be given; if the fever is very high, and is not reduced by the intestinal irrigation, the whole body should be washed with alcohol. His dietetic regulations are in accord with those generally accepted at the present day.

ANTISPASMIN, A NEW REMEDY FOR WHOOPING-COUGH.

FRÜHWALD (*Archiv f. Kinderheilkunde*, Bd. xviii. Hft. 1 u. 2, S. 38) publishes his experience with antispasmin, a new hypnotic and sedative, which he has used with very satisfactory results in whooping-cough. Antispasmin, first brought to notice by Demme, is a combination of one molecule of narceinnatrium with three of salicylate of sodium. It is a white, feebly hygroscopic powder, readily soluble in water. According to Demme, it is a decided hypnotic and sedative in painful affections, especially of a spasmodic character.

The author has employed it in over two hundred cases of whooping-cough, and has experienced no bad effects upon the stomach or intestinal canal, nor a cumulative narcotic action even in very young children. The general

effect noted has been prompt reduction in the intensity and number of attacks, and some shortening in the duration of the disease. The drug was usually ordered in a 5 or 10 per cent. solution, with dilute water of bitter almond, three or four times daily in a tablespoonful of sugar-water, or in milk or cocoa, in soup, or for older children on a half-coffeespoonful of pounded sugar. Of the 5 per cent. solution the dose for an infant under six months was 3 to 5 drops (=0.01 pro dosi); for a child of one year, 8 to 10 drops; two years, 10 to 12 drops; three years, 15 to 20 drops. For children over three years of age the 10 per cent. solution was used, beginning with a dose of 10 drops, three times daily, increasing, if necessary, to 15-drop doses, three or four times daily. The solution should be protected from the light by using a blue-glass bottle. The price of the drug at present is said to be high.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

JOHN SLADE ELY, M.D.,

PROFESSOR OF PATHOLOGY IN THE WOMAN'S MEDICAL COLLEGE OF THE NEW YORK INFIRMARY; ASSISTANT IN PATHOLOGY IN THE COLLEGE OF PHYSICIANS AND SURGEONS; PATHOLOGIST TO BELLEVUE HOSPITAL.

Leucocytosis in Diphtheria.

Gabritschewsky (*Annales de l'Institut Pasteur*, 1894, viii. No. 10) has investigated the occurrence of leucocytosis in diphtheria, and the effect upon it of injections of antitoxic serum.

Fourteen cases of diphtheria in children form the basis of his observations. In all there was decided increase in the number of leucocytes in the blood. In six of the cases which ended fatally this leucocytosis increased greatly as the disease progressed, reaching a maximum a few hours before death, from which it would appear that hyper-leucocytosis is a distinctly unfavorable sign in diphtheria, diphtheria in this regard differing decidedly from acute lobar pneumonia and several other of the infectious diseases, in which leucocytosis would appear to be a material aid to recovery.

In eight of the cases, which were treated with antitoxic serum and in which recovery took place, a decided diminution in the number of leucocytes immediately followed the antitoxin injections.

Experiments with rabbits yielded the same results. Inoculations of diphtheria bacilli were followed by pronounced leucocytosis, which diminished after injections of antitoxin. Rabbits immunized before inoculation showed only moderate increase in the number of leucocytes, and this disappeared after twenty-four hours or so, while the leucocytosis of animals which had not been previously immunized increased steadily. There was also less rapid

necrosis of the tissues and of the exudate at the point of inoculation in animals which had been immunized, and a greater activity of the leucocytes as phagocytes was noted in such animals. Similar results followed the inoculation of the vaginal mucous membrane of guinea-pigs.

As the result of his experiments, Gabritschewsky arrives at the following conclusions:

1. The leucocytosis of diphtheria is materially different from that of the other infectious diseases which have been investigated in that particular.

2. Hyper-leucocytosis is in diphtheria a distinctly unfavorable sign, and, consequently, valuable indications as to the progress of a case and the efficiency of any particular plan of treatment may often be gained from examination of the blood.

3. The diphtheria bacilli which find their way into the body are destroyed by the phagocytic action of the leucocytes.

4. The majority of the diphtheria bacilli concerned in the production of the lesion of diphtheria are cast off in the false membrane; only a very small number are disposed of by phagocytosis.

5. The action of the poison of diphtheria in inducing necrosis of cells tends to lessen the power of the leucocytes to act as phagocytes.

6. The action of antitoxic serum is to make all the cells of the body more resistant to the destructive action of the diphtheritic poison.

On Mixed Infection in Diphtheria.

The frequent association of the *streptococcus pyogenes* with the specific germ of diphtheria in the false membrane of that disease has been quite generally recognized by those who have carefully investigated its etiology, but its exact significance when thus associated has been uncertain. The fact that it produces, not infrequently, a croupous inflammation of the pharyngeal mucous membrane closely resembling in its clinical aspects that of true diphtheria is certainly suggestive that, at times, its *rôle* in diphtheria may be an important one.

With a view to throwing light upon this question, Bernheim (*Zeitschr. f. Hygiene u. Infectionskrankhtn.*, 1894, xviii. 529) has made a careful clinical and experimental study of the part played by the associated bacteria, basing his observations upon eleven cases of diphtheria. The streptococcus longus, streptococcus brevis, and staphylococci were found associated with Loeffler's bacillus in ten, eight, and six cases respectively, several of these species being present in a number of the cases. Animal inoculations showed the virulence of these germs to be very different in different cases, and as the number of them present and their virulence bore no definite relation to the severity of the cases Bernheim concludes that, from a bacteriological examination alone of the false membrane, but little information is to be gained as to the severity of any particular case.

Of special interest, however, is that part of the paper which relates Bernheim's attempt to determine by experiment the part played by the associated bacteria.

Associated bacteria, he says, may act in one or both of two ways upon the

specific bacteria of a disease. They may accelerate or inhibit their growth or they may increase or diminish their virulence. It is evident that their effect will be important when they both accelerate the growth and increase the virulence of the specific germ. In his experiments with mixed bouillon-cultures of the bacillus diphtheriæ and the streptococcus Bernheim found that, while after a time the streptococcus died out, the diphtheria bacillus seemed to be stimulated to a rather more rapid and abundant growth than that which occurred when that germ was cultivated alone in the same medium. The growth of the diphtheria bacillus was also abundant in bouillon in which the streptococcus had been grown, but from which it had been removed by filtration. No similar effect was found to be produced by the staphylococci.

The virulence of the diphtheria bacillus appeared to be also increased by the presence of the streptococcus, but not so much so in cultures as when both germs were inoculated simultaneously. Thus, guinea-pigs without exception suffered more pronounced lesions, and died more quickly when both germs were inoculated than when Loeffler's bacillus alone was introduced. In this particular, also, the action of the staphylococcus was found to be different, for in several of the experiments the effect of the diphtheria bacillus seemed to be distinctly lessened by simultaneous injection of the staphylococcus.

That this more intense action of the diphtheria bacillus and streptococcus when inoculated together was not simply due to the fact that two species of virulent germs simultaneously produced their noxious effects was shown by the fact that cultures of the bacilli grown in streptococcus bouillon (from which all streptococci had been removed by filtration) were also found to possess a higher degree of virulence than similar cultures in bouillon in which streptococci had not been grown. It would thus appear that the virulence of the diphtheria bacillus is distinctly increased by the presence of the products of streptococcus growth.

In one of his cases Bernheim found the pseudo-diphtheria bacillus in association with Loeffler's, and it occurred to him that this germ might acquire virulence in the presence of the streptococcus; but all efforts to accomplish such a change by cultivation with the streptococcus and in bouillon containing streptococcus products were fruitless, a new point of difference between the true and the pseudo-diphtheria bacillus being thus developed.

With a view to determining the frequency of the occurrence of associated bacteria in the internal organs, REICHE (*Centralbl. f. innere Mêdicin*, 1895, xvi. No. 3) has examined the bodies of forty-two patients who died of diphtheria. In 64.3 per cent. of the cases either streptococcus or staphylococcus, or both, were present, and in 45.2 per cent. the streptococcus was present alone. In one case, that of a child who died on the second day of the disease, streptococci were obtained from the internal organs, demonstrating the rapidity of their penetration into the tissues.

THE PRESERVATION OF URINARY SEDIMENTS.

The following method of preserving urinary sediments is described by FISCHEL (*Prager medicin. Woch.*, 1895, No. 12) as superior to those which have heretofore been in use.

After collection of the sediment by settling, or by means of the centrifugal machine, it is twice washed with distilled water to remove the urine as completely as possible. It is then covered by a mixture of equal parts of glycerin and distilled water to which about 2 per cent. of a saturated alcoholic solution of thymol has been added.

As tested by Fischel, all manner of formed urinary sediments were preserved in this way for ten weeks in their original size and shape. They may, furthermore, be stained before preservation by the aniline dyes or hæmatoxylin.

Aside from its value to the teacher as a means of preservation of urinary and other formed pathological products, Fischel believes that such a method is of value to the clinician in that it enables him to make a comparison of the urinary exudate from time to time during the course of a nephritis, and thus to form a better opinion as to the progress of the disease.

Comparison of the Berkefeld and Chamberland-Pasteur Filters.

Dachnjewski (*Wratsch*, 1893, No. 19) has made a careful comparison of the Berkefeld and Chamberland-Pasteur filters as regards their efficiency as bacterial filters. In all particulars, except that it was somewhat more rapidly penetrated by the bacteria, the Berkefeld showed decided superiority. The Chamberland filter removed all bacteria from ordinary hydrant-water for from three to four weeks, while the Berkefeld was penetrated by them in from seven to ten days. The Berkefeld, however, filtered more than twice as rapidly, and is much cheaper. It is, therefore, strongly recommended as a filter for use in private houses and in hospitals.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,

OF LONDON;

AND

CHARLES HARRINGTON, M.D.,

INSTRUCTOR IN MATERIA MEDICA AND HYGIENE, HARVARD MEDICAL SCHOOL.

The Etiology of Typhoid Fever.

In an address delivered before the Fourteenth Congress of the Sanitary Institute, held at Liverpool in September, Klein (*Brit. Med. Journal*, Oct. 13, 1894) concisely rehearses the argument in favor of the etiological relationship of the *bacillus typhosus* to typhoid fever, expressing himself unequivocally against the theory of Roux, Vallet, Arloing, Kellog, and others, that the typhoid bacillus is nothing more than the *bacillus coli communis* which has

acquired specific and virulent qualities by the action of sewage. In overthrowing this theory Klein carefully reviews the morphology and cultural peculiarities of the two germs in question, showing them to possess distinct specific differences.

After pointing out differences in shape and size, in motility, and in manner of growth on the different culture-media, he continues: "The three principal cultural characters, however, by which the two organisms can be distinguished best and easiest are: shake cultures in gelatin, milk cultures, and broth cultures. While the bacillus coli rapidly forms gas bubbles in gelatin shake cultures, the typhoid bacillus does not do so; while the bacillus coli curdles milk, the typhoid bacillus does not do so; and while the bacillus coli produces indol in broth cultures, the typhoid bacillus does not do so."

These characters of both germs are preserved through any number of generations, they are not influenced by prolonged action of sewage, and every effort to produce artificially from bacillus coli a species giving the cultural peculiarities of the typhoid bacillus has been futile.

Marked differences in the pathogenic action of the two germs when inoculated in animals are also cited.

An interesting point brought out by Klein is that the addition of nitrates to water materially increases its power to support the typhoid bacillus in a virulent condition. This would appear to explain the long persistence of the typhoid germ at times in water contaminated by sewage, or which has percolated through nitrate-containing soil.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., London, W., Eng.

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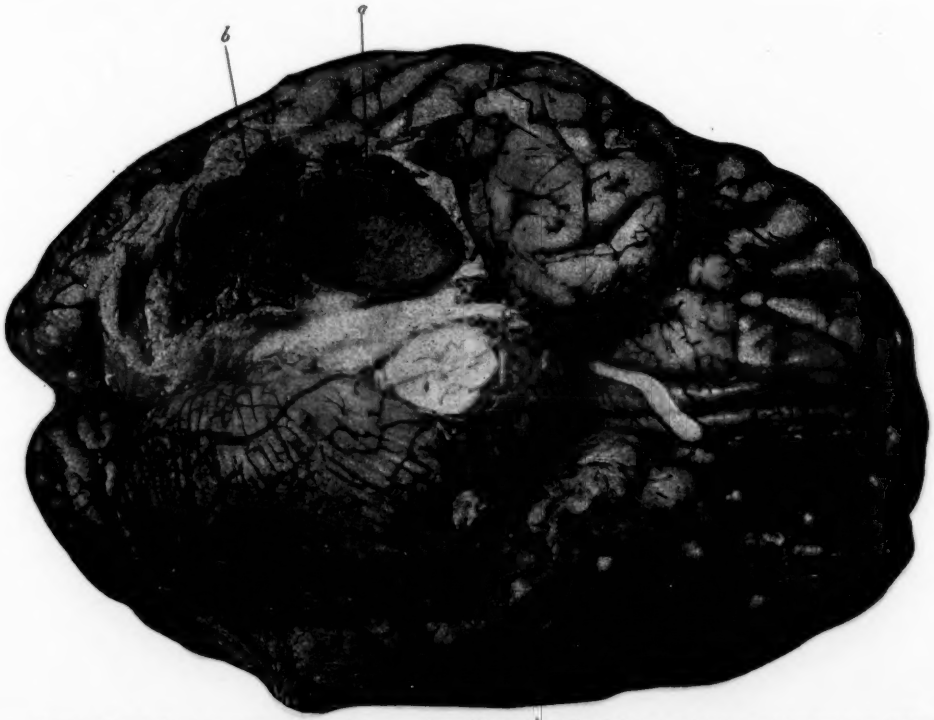

Abscess of cerebellum secondary to chronic suppurative otitis media. The right cerebellar hemisphere has been divided and the lower half removed, exposing the abscess cavity and its wall (*a*), and the area of hemorrhagic softening posterior to the abscess (*b*).